

REPORT

UNITED STATES
JAN 18 1903

OF THE

COMMISSIONER OF THE INTERIOR FOR PORTO RICO

TO THE

From

SECRETARY OF THE INTERIOR, U. S. A.

Jan. 18, '03

1902.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1902.

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ADJUNTAS-PONCE ROAD. NEW CONCRETE CULVERT.

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COMMISSIONER OF THE INTERIOR FOR PORTO RICO.

EXECUTIVE MANSION, PORTO RICO,
San Juan, October 25, 1902.

SIR: I have the honor to herewith transmit the annual report of the commissioner of the interior for the island of Porto Rico.

Very respectfully,

WILLIAM H. HUNT,
Governor.

The SECRETARY OF THE INTERIOR,
Washington, D. C.

DEPARTMENT OF THE INTERIOR OF PORTO RICO,
OFFICE OF THE COMMISSIONER.
San Juan, October 20, 1902.

SIR: In compliance with your request, of date July 7, 1902, addressed to the governor of Porto Rico, I have the honor to submit my third annual report as commissioner of the interior for Porto Rico, together with the reports from the several chiefs or heads of the bureaus and divisions constituting the department of the interior of Porto Rico as organized upon the inauguration of civil government in the island, and since augmented or diminished as the administration of affairs has seemed to require. The only material change in the organization during the fiscal year just closed has been the addition, by act of the legislative assembly, of a bureau of docks and harbors, for the proper enforcement of harbor regulations, collection of fees and fines, and the eventual improvement of the several important ports of the island. The organization of this bureau, which is destined to grow in importance and value to the shipping interests as the commerce continues to increase in volume, was delayed a few months pending the completion and approval by the executive council of the rules and regulations provided for the government of docks and harbors, but late in June it was put into full operation under conditions that promise well for all concerned.

PUBLIC LANDS.

In my report for 1901 I referred to the status of the so-called "public lands" of Porto Rico, and after discussing briefly some of the provisions of the treaty of Paris and the civil code of Spain in relation

thereto, suggested the importance of a legal determination of the question raised, preliminary to other action. The matter was submitted by your Department to the honorable Attorney-General of the United States and his opinion obtained. It did not seem to me that this finding fully covered the points raised in my report, but as, at the time of its promulgation, Congress was considering the advisability of a speedy disposition of the question without particular reference to title except in so far as the lands reserved for Federal occupation should stand clear of counterclaim or dispute, the matter was allowed to rest. The Congress, on July 1, 1902, passed an act which authorized the President to make, within one year after the approval of the act, such reservation of public lands and buildings belonging to the United States in the island of Porto Rico for military, naval, light-house, marine-hospital, post-offices, custom-houses, United States courts, and other public purposes as he may deem necessary, and providing that all remaining public lands and buildings, not including harbor areas and navigable streams and bodies of water and the submerged lands underlying the same, be granted to the government of Porto Rico, to be held or disposed of for the use and benefit of the people of said island.

The enactment of that law gave great satisfaction to the people of Porto Rico, both on account of the evidence it offered of the continuation of a liberal policy toward the island and as presenting the means for a just and speedy solution of all matters relating to public lands and buildings. This Department has had all of the properties involved carefully located, described, and the history of each noted. The several Departments of the Federal Government will be asked to make known their wishes concerning properties at present occupied by or needed for their accommodation, and it is sincerely hoped that agreements may be reached and the whole matter placed before the President for approval at an early date.

The bulk of the property involved comprises lands of little present value, but which may, if the island continues to develop and prosper as conditions now prevailing warrant the hope, become saleable. They need to be located and their boundaries determined, which will be a difficult and costly work. There are, however, some lands within or near the cities and larger towns which will be immediately available. To the east of the city of San Juan there lies a considerable tract that was withheld from improvement by governmental decree or military occupation under the Spanish régime. These lands constitute the only territory for city expansion, of which there is sore need from both sanitary and business points of view, for the existing congested condition of the population in the old portion of the city defies the proper enforcement of sanitary regulations, and when, as is expected and desired, the whole Marina district shall be taken over for the establishment of a naval station, the custom-house, the many warehouses, wholesale establishments, the numerous factories, and the thousands of people now quartered there must find locations and habitations elsewhere.

The only possible outlet on the little island upon which the city of San Juan stands is the land above referred to. It is desirable, therefore, and, to all interests concerned, quite important that all questions be settled and Presidential action secured in time for the legislative assembly of Porto Rico to provide for the disposition of island property at the session to be held during January and February, 1903.



MASONRY BRIDGE WITH CONCRETE ARCH, BAYAMON-COMERIO ROAD.

PUBLIC ROADS AND BRIDGES.

In previous reports I endeavored to emphasize the need of good roads and bridges as the key to prosperity in Porto Rico. Time has given ardor to my convictions, and the splendid results following the construction or substantial repair of roads wherever it has been possible to confer the benefit have lent enthusiasm to my desire to push the work ahead. Road building in Porto Rico is not, however, an easy task, nor a project to be quickly performed. The mountainous character of the interior makes difficult the location, costly and slow the labor of construction. Sudden and torrential rains cause great landslides, ruinous washouts, and vexatious destruction of bridges and culverts. The soil is treacherous, upsetting the most carefully planned engineering for its control.

Every road becomes a problem unto itself, experience in another locality counting for but little in its construction. No road is undertaken until the survey has been carefully made, the character of the soil and rock closely studied, and provision made for the building of a solid bed with complete and ample drainage and well-laid macadam. I do not believe better roads are built anywhere than in Porto Rico, and it is a matter for regret that the means and facilities at command, together with the conditions controlling construction, forbid rapidity of progress commensurate with the needs of interior communities.

The legislative assembly, at its last session, passed an act abolishing the board of public works and providing for the organization of a bureau instead. The same act repealed most of the provisions of the old Spanish laws not previously abolished by military orders, and under which the board had been compelled to operate, often at great disadvantage. The new law made provision for the complete organization of the bureau of public works on a basis that greatly facilitates its work.

There was also enacted at the same session of the legislative assembly a well considered road law, which provides for the division of the island into seven road districts, each to be in charge of three supervisors, and sets aside 25 per cent of the municipal taxes for the construction and repair of roads as determined by the board of supervisors. This law is intended to apply to country roads and trails not directly in charge of the insular authorities, and it is expected that the wise and economical expenditure of the revenues obtained for this purpose will prove of great benefit to the interior communities.

The report of the superintendent of public works, presented herewith (Exhibit A), states in detail the operations of the bureau during the past year, the synopsis of disbursements showing the total of expenditures to have been \$628,687.72. The balance of \$236,389.12, as stated in Appendix B of the report, is largely the sum of unexpended portions of allotments for the construction of roads under contract, and which will be completed at an early date. The affairs of this bureau have been honestly and efficiently administered. It is a bureau which, by reason of its close relations to the people, especially the agriculturists, is naturally depended upon to relieve adverse conditions, and in consequence of inability, physical or financial, to meet every expectation, reasonable or otherwise, encounters a great deal of criticism, in dealing with which there is ample opportunity for the exercise of patience.

PUBLIC HEALTH.

In presenting the report of the president of the superior board of health (Exhibit B), I would call attention to the gratifying improvement shown in all matters relating to the health, comfort, and convenience of the people. The difficulties of administration noted in my report for 1900-1901 continued throughout the year. But at the last session of the legislative assembly new laws, providing for a complete reorganization of the system and granting ample power for the enforcement of proper regulations, were enacted, and went into operation on July 1. The record of vital statistics shows a gratifying decrease in the number of deaths and freedom from epidemics of all kinds.

AGRICULTURE AND MINES.

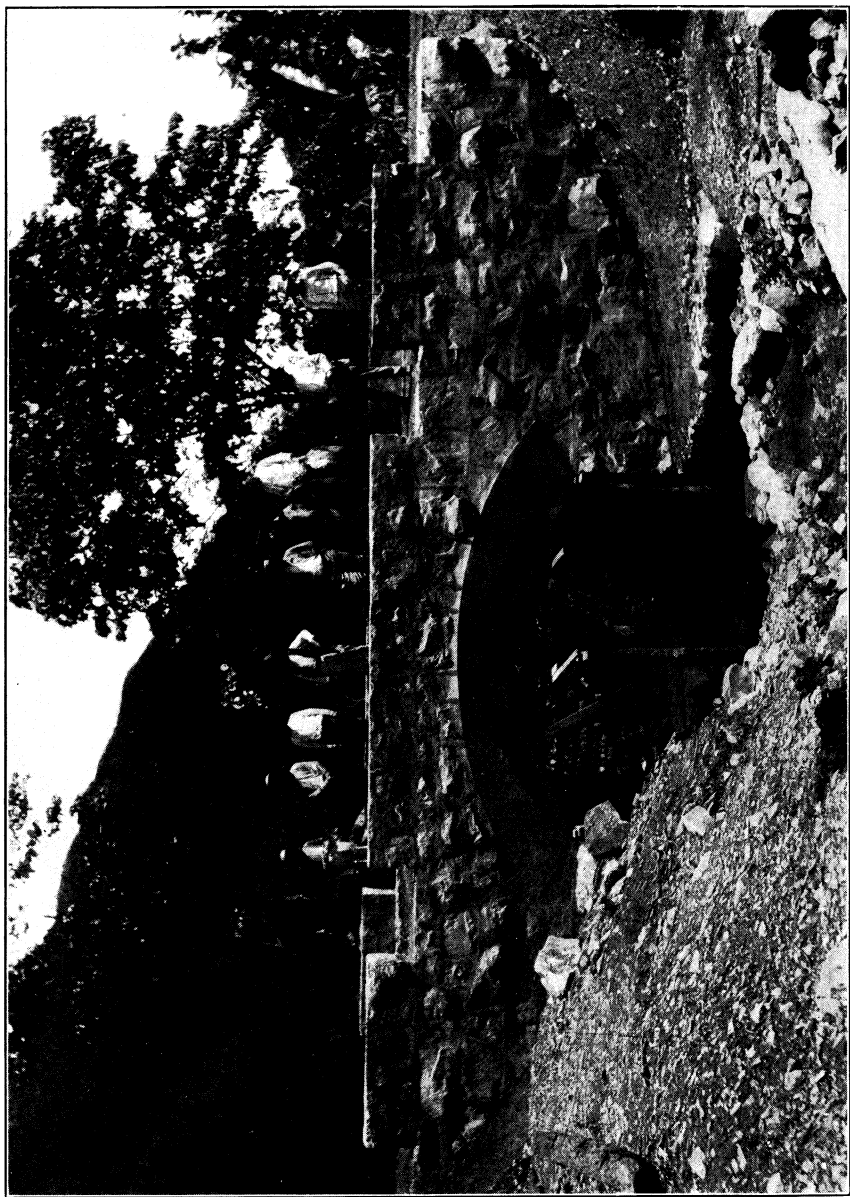
The report of the chief of the bureau of agriculture and mines (Exhibit C) shows a substantial increase in the production of sugar and tobacco, excellent progress in the restoration of coffee plantations to their normal condition, and increasing activity in the planting and cultivation of tropical fruit trees. Agricultural development has been general and steady over the island, and the good results are apparent in increased business activity, active demand for labor, and better wages. The people prove, in appearance and demeanor, their appreciation of the better condition of affairs, and I confidently predict for Porto Rico an era of prosperity never before experienced in the island.

THE TELEGRAPH SYSTEM.

The report of the chief of the bureau of insular telegraph (Exhibit D) presents an interesting account of the development of that system from the date of its taking over from the United States Signal Corps, as noted in my last report, to the present time. The legislative assembly made liberal provision for extension of the lines, in the belief, evidently, that the commercial prospects of the island would warrant the outlay, and the growth of business, as shown by the statement of receipts and expenditures accompanying the report, is substantial proof of the wisdom of the course.

CONCLUDING REMARK.

Particular comment on the work accomplished by this department through its several bureaus and divisions is not practicable without repetition of the matter contained in the accompanying reports, each of which presents a clear and precise statement of the facts and circumstances concerning the operations of the bureau named. I am pleased to commend the reports *in toto* as embodying a story of substantial progress in the establishment and maintenance of good government in Porto Rico, obtained by administering to the first and greatest need of the people in the construction and repair of roads, to the end that they may feel encouraged to labor in the assurance of means to reach the markets with the products of the soil; by affording advice and instruction concerning what to plant and how to cultivate most economically and profitably; by the introduction of sanitary rules and regulations and encouraging the people in habits of cleanliness and



NEW CULVERT ON THE UTUADO-ADJUNTAS ROAD.

correct living, and by assistance in matters affecting trade and commerce at home and abroad. We fully realize that the people of the United States regard with deep interest the course of events in Porto Rico, and it is a source of great pleasure to one charged with a portion of the responsibility of the problem here presented to be able to offer such evidences of advancement in the solution. Much yet remains for accomplishment, yet the appreciation by the people of that which has been done is apparently so sincere that there is no occasion for discouragement.

Very respectfully,

W. H. ELLIOTT,

Commissioner of the Interior for Porto Rico.

Hon. ETHAN ALLEN HITCHCOCK,

Secretary of the Interior.

(Through the governor of Porto Rico.)

EXHIBIT A.

REPORT OF THE SUPERINTENDENT OF PUBLIC WORKS.

DEPARTMENT OF THE INTERIOR OF PORTO RICO,
BUREAU OF PUBLIC WORKS,
San Juan, August 15, 1902.

SIR: I have the honor to submit herewith report of operations for the fiscal year ending June 30, 1902.

The work of this bureau was carried on until March 1, 1902, under the old organization as a board. On that date the board was abolished, by special act of the legislature, and a bureau of public works was created, which in spirit, organization, and method of doing business conforms more to the changes and requirements made necessary by the enforcement of the so-called Foraker law. At the same time there were enacted two more important laws which affect to some degree this bureau—a country road law based upon the division of the island into counties, and the regulations referring to policing of highways. The latter was immediately promulgated; the former still awaits the preliminary steps to be taken by the new county authorities.

The organization of this bureau has remained practically the same as the previous year. The work is at present subdivided into three divisions: (1) Roads and bridges; (2) public buildings and grounds, and (3) franchises. Except in the buildings division, all employees are more or less assigned to one work or another, as occasion arises, and official titles and their prerogatives have lost much of their former glory. It is a pleasure to say, however, that considering the large amount of work that has been done the last year and the manifold duties which each employee has to perform, the willingness and readiness with which each man acceded to the requirements of the service has been quite noticeable and, excepting a few sporadic cases of pertinacity, the improvements in that direction reflect credit upon the employees of the bureau.

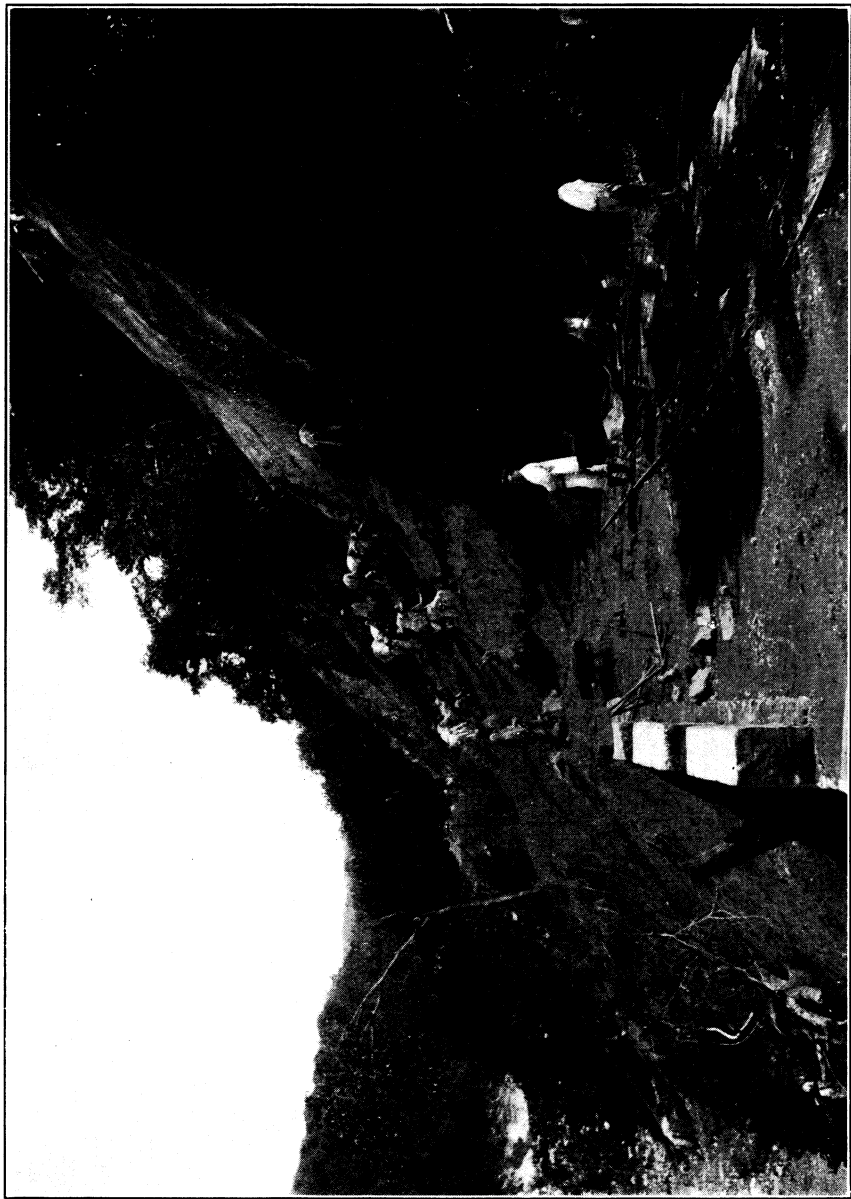
Especial mention is made of the valuable and diligent labor performed by the pay division in charge of the disbursing officer. The disbursements made during the past year amounted to over \$600,000. Most of the payments are made by checks. The laborers are paid, however, in cash, by special permission from the governor, the money being sent by registered mail and insured, except in cases when it is placed in the hands of specially appointed paymasters. It is gratifying to note that in these average monthly disbursements of about \$14,000 in cash not a single mistake has been recorded so far, either in the contents of the pay envelopes or in the names marked thereon, the amounts inclosed varying from 10 cents to \$30.

I have also to acknowledge herewith the constant and faithful service rendered me and the bureau by the assistant superintendent, whose local experience and knowledge of men and technical matters in connection with past periods of our works are invaluable.

(1) ROADS AND BRIDGES.

This division constitutes at present the most important one of the bureau, performs the largest amount of work, and consequently sustains the heaviest expenditures. It may be properly subdivided into: (1) Maintenance of roads; (2) construction of new and reconstruction of old and unfinished roads; (3) surveys and examinations for new roads and bridge sites.

Numerically the personnel pertaining to this division has been exceptionally large during the past year, principally on account of the many surveying parties in the field and the extensive repairs and construction work done on roads by day labor. Besides the regular road force on maintenance, which consists of road supervisors, overseers, foremen, section men, and laborers, there were employed ten assistant engineers on surveys and construction work, each one of which had for assistants about four instrument men who, when necessary, acted also as inspectors. On the repairs of old roads were employed on an average eleven temporary overseers, men of experience, who organized their working forces in accordance with the needs



UTUADO-ADJUNTAS ROAD. EXCAVATING FOR NEW ROAD.

of the moment. It is estimated that during the past year no less than 20,000 men, exclusive of the regular force, have found employment on road work as laborers, not to mention the thousands employed by road contractors.

The assistant superintendent exercises special supervision over surveys and the reconstruction and repairs of old roads, and those in local charge report directly to him. The road supervisors on maintenance, of whom one is located in San Juan and Ponce, respectively, and the assistant engineers in local charge of new work, who are individually held responsible for the proper execution of work assigned them, report directly to headquarters. Under the present organization the services of the road supervisors and the force under them are needed throughout the year; those of the assistant engineers and their assistants are temporary and special only for the work in hand. Nevertheless, it has been made a rule in this bureau not only to assign each member of the technical force, including overseers and inspectors, to any particular work in which they have had experience and have shown notable aptitude, but to intrust them more or less with work of all kinds related to the branches of engineering carried on principally in this bureau. In that respect their general education and usefulness has considerably broadened, and it has removed in a great degree the incubus which formerly dragged upon the progress of engineering on this island when everybody claimed to be a specialist in little things. As an illustration I need only to cite the rapid strides that have been made here in concrete construction since the American occupation, a method of construction almost unknown before, and of which only recently all members of our technical force have obtained a fair and equal knowledge because no attempt was made from the beginning to educate for that purpose specialists, as probably would have been done under the old régime.

1. *Maintenance of roads.*—The total number of kilometers of macadam roads maintained and taken care of by this bureau during the past year is 424.10, of which 381 were maintained by the regular force and 43.10 kilometers by extra gangs of men in charge of special overseers when more than ordinary care was required on account of the incomplete and new state of the works.

The roads under maintenance are as follows:

TABLE NO. 1.—*Roads in maintenance.*

	Kilometers.
San Juan to Ponce Playa.....	134.0
Rio Piedras to Mameyes.....	32.3
Catano to Vega Alta.....	22.0
Reyes Catolicos Bridge to Corozal.....	16.0
Comerio toward Bayamon.....	4.0
Manati to Ciales.....	12.8
Morovis toward junction of road Manati-Ciales.....	5.0
Arecibo to Utuado.....	32.0
Utuado toward Adjuntas.....	1.5
Adjuntas toward Utuado.....	2.0
Adjuntas toward Ponce.....	8.1
Ponce toward Adjuntas.....	15.0
Aguadilla to San Sebastian.....	23.7
Anasco to Mayaguez and Mayaguez to Pezuela Bridge.....	22.7
Mayaguez toward Las Marias ^a	23.3
Cayey to Arroyo.....	33.5
Caguas to Humacao Playa.....	36.2
Total.....	424.1

Of this total 284.1 kilometers were constructed by the Spanish Government and 140 kilometers by the Americans, the location and lengths of the roads or sections of roads being as follows:

TABLE NO. 2.—*Macadam roads constructed under the Spanish Government, 1860-1898.*

	Kilometers.
San Juan to Ponce Playa.....	134
Cataño to Toa Alta.....	22
Añasco to Mayaguez and Mayaguez to Pezuela bridge.....	22.7
Ponce toward Adjuntas.....	15
Rio Piedras toward Mameyes.....	30.6
Utuado to Caguanitas bridge.....	4

^a Fifteen kilometers maintained by city of Mayaguez.

10 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

	Kilometers.
San Sebastian toward Moca	6.3
Cayey to Guayama	26.5
Mayaguez to Consumo (toward Las Marias)	15
Corozal toward Toa Alta	3
Comerio toward Bayamon	2
Between Vega Alta and Reyes Catolicos bridge.....	3
Total	284.1

TABLE NO. 3.—*Macadam roads constructed under the American Government, 1898-1902.*

	Kilometers.
Mameyes toward Rio Grande	1.7
Caguas to Humacao Playa	36.2
Comerio toward Bayamon	2
Toa Alta toward Corozal	10
Manati to Ciales	12.8
Morovis toward junction of road Manati-Ciales	5
Arecibo toward Utuado	28
Utuado toward Adjuntas	1.5
Adjuntas toward Utuado	2
Adjuntas toward Ponce	8.1
Aguadilla to Moca	7
Moca toward San Sebastian	10.4
Consumo toward Las Marias	8.3
Guayama to Arroyo	7
Total	140

In response to advertisement published in various papers for the furnishing of broken stone required as supplies for maintenance in different sections of the main roads, the Bureau received the following bids:

TABLE NO. 4.—*Abstract of proposals for furnishing broken stone in various sections of the island, opened at the office of the board of public works of Porto Rico, September 30, 1901.*

[Section No. 1. Kilometers "0" to 21. 6,000 cubic meters.]		Per cubic meter.
Pedro Schira, San Juan		\$2.75
Manuel Jose Gestera, San Juan		2.50
Ricardo G. Camba, Rio Piedras		2.50
Carlos de Ereño, Manati		2.35
Marix & Co., San Juan		2.25
Jose Balado, Santurce		2.20

[Section No. 2. Kilometers, 22 to 48. 7,000 cubic meters.]		Per cubic meter.
Roque Paniagua, San Juan		\$3.00
Marix & Co., San Juan		2.00
Jose Balado, Santurce		2.00
Carlos de Ereño, Manati		1.90
Ricardo G. Camba, Rio Piedras		1.49

[Section No. 3. Kilometers, 49 to 69. 5,000 cubic meters.]		Per cubic meter.
Jose Balado, Santurce		\$2.50
Roque Paniagua, San Juan		2.00
Marix & Co., San Juan		2.00
M. Munitiz, Cayey		1.95
Carlos de Ereño, Manati		1.70
Ricardo G. Camba, Rio Piedras		1.40

[Section 4. Cataño to Toa Alta. 2,000 cubic meters.]		Per cubic meter.
Roque Paniagua, San Juan		\$2.50
Marix & Co., San Juan		2.00
Inocencio Sanchez, Toa Baja		1.95

[Section 5. Rio Piedras to Mameyes. 6,000 cubic meters.]

	Per cubic meter.
Manuel Jose Gestera, San Juan.....	\$2.50
Marix & Co., San Juan.....	2.00
Jose Balado, San Juan.....	1.90
Carlos de Ereño, Manati.....	1.80
Pedro Schira, San Juan.....	1.80
Ricardo G. Camba, Rio Piedras.....	1.79
Felipe Sanchez, Carolina.....	1.74

[Section No. 6. Toa Alta to Corozal. 1,000 cubic meters.]

	Per cubic meter.
Marix & Co., San Juan.....	\$2.00
Roque Paniagua, San Juan.....	1.90
Andres G. Canton, Naranjito.....	1.38

[Section No. 7. Kilometers 70 to 90. 3,000 cubic meters.]

	Per cubic meter.
Roque Paniagua, San Juan.....	\$2.20
Marix & Co., San Juan.....	2.00
J. S. Torres y T. Gonzalez, Coamo.....	2.00
N. Pirazzi, Ponce.....	1.69
Ricardo G. Camba, Rio Piedras.....	1.40

[Section No. 8. Cayey to Arroyo. 2,500 cubic meters.]

	Per cubic meter.
Jose Juan Vidal, Guayama.....	\$2.50
N. Pirazzi, Ponce.....	2.49
Marix & Co., San Juan.....	2.00
Roque Paniagua, San Juan.....	2.00
M. Munitiz, Cayey.....	1.95

[Section No. 9. Ponce to Adjuntas. 2,000 cubic meters.]

	Per cubic meter.
Roque Paniagua, San Juan.....	\$2.20
Marix & Co., San Juan.....	2.00
Ricardo G. Camba, Rio Piedras.....	2.00
Carlos Clausells, Ponce.....	1.80

Many of the bids were irregular, lacking certain legal requirements, caused principally by inexperience or by inability to understand the prescribed conditions in the form of proposals, which are printed in English. Those near the bottom of the list who claimed to be right, but were not, objected to the lowest bidders, and to stop all further clamor new bids were ordered and asked for. The new bids received were as follows:

TABLE NO. 5.—*Abstract of proposals for the furnishing of broken stone in different sections of the island, opened at the office of the board of public works of Porto Rico, October 30, 1901.*

[Section No. 1. Road No. 1. Kilometers, "0" to 21. 6,000 cubic meters.]

	Per cubic meter.
Pedro Schira, San Juan.....	\$2.50
Ricardo G. Camba, Rio Piedras.....	2.50
Jose Balado, San Juan.....	2.20
Manuel Jose Gestera, San Juan.....	2.10
Marix & Co., San Juan.....	2.09
Salas & Janes, San Juan.....	2.08
Roque Paniagua, San Juan.....	2.06
Wm. A. Hutton, San Juan.....	1.97
Carlos de Ereño, Manati ^a	1.95

^aContract awarded.

12 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

[Section No. 2. Road No. 1. Kilometers 22 to 48. 7,000 cubic meters.]

	Per cubic meter.
Roque Paniagua, San Juan	\$1.94
Wm. A. Hutton, San Juan	1.74
Jose Balado, San Juan	1.70
Salas & Janes, San Juan	1.64
Ricardo G. Camba, Rio Piedras	1.59
Carlos de Ereño, Manati ^a	1.50

[Section No. 3. Road No. 1. Kilometers 49 to 60. 5,000 cubic meters.]

	Per cubic meter.
Roque Paniagua, San Juan	\$1.84
M. Munitiz, Cayey	1.82
Wm. A. Hutton, San Juan	1.68
Salas & Janes, San Juan	1.55
Ricardo G. Camba, Rio Piedras ^a	1.54

[Section No. 4. Road No. 2. Cataño to Toa Alta. 2,000 cubic meters.]

	Per cubic meter
Wm. A. Hutton, San Juan	\$2.47
Salas & Janes, San Juan	1.85
Jose Balado, San Juan	1.85
Inocencio Sanchez, Toa Baja ^a	1.97

[Section No. 5. Road No. 7. Rio Piedras to Mameyes. 6,000 cubic meters.]

	Per cubic meter.
Juan Molfulleda y Ebras, Rio Piedras	\$2.55
Manuel Jose Gestera, San Juan	2.00
Ricardo G. Camba, Rio Piedras	1.79
Pedro Schira, San Juan	1.75
Wm. A. Hutton, San Juan	1.72
Felipe Sanchez, Carolina	1.70
Eugenio Gomez Caldas, Rio Piedras	1.70
Salas & Janes, San Juan	1.68
Enrique Ubarri, Rio Piedras	1.60
Carlos de Ereño, Manati ^a	1.59

[Section No. 6. Road No. 10. Toa Alta to Corozal. 1,000 cubic meters.]

	Per cubic meter.
Salas & Janes, San Juan	\$3.67
Wm. A. Hutton, San Juan	2.19
Andres G. Canton, Naranjito ^a	1.38

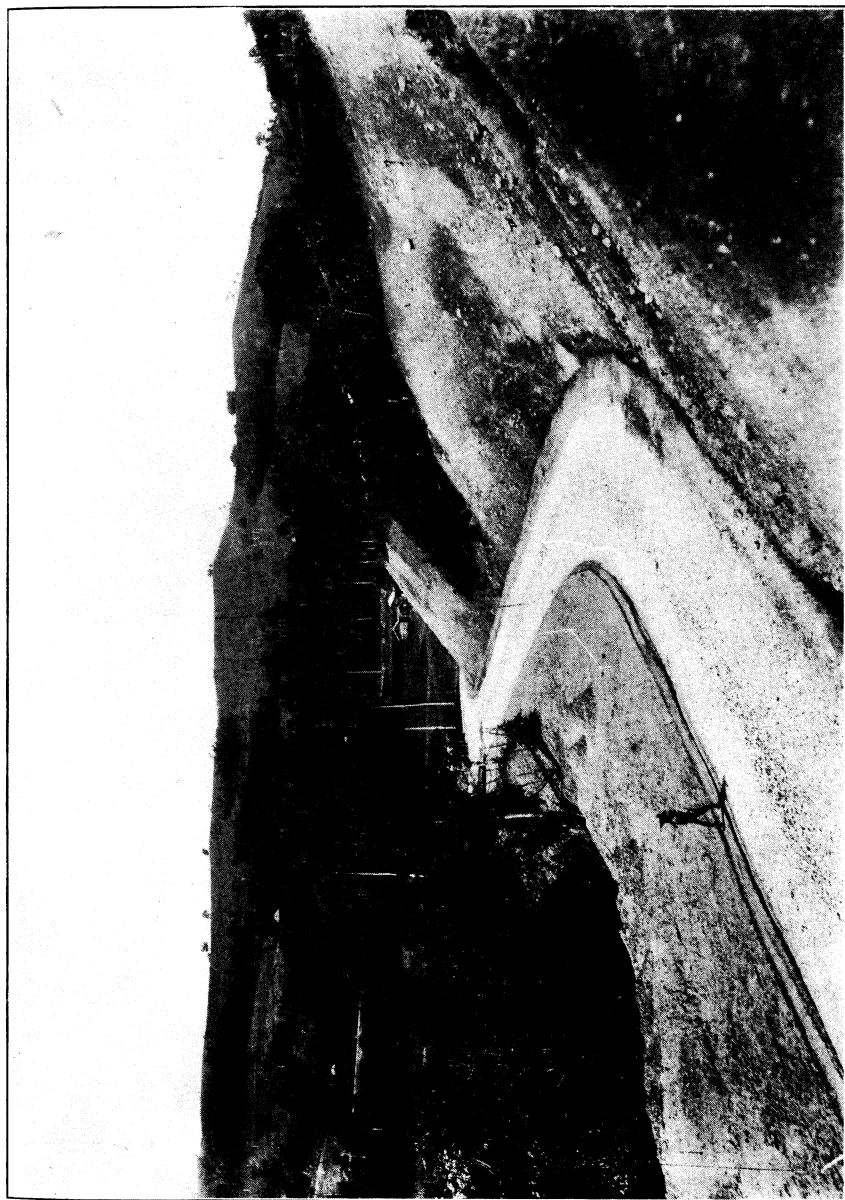
[Section No. 7. Road No. 1. Kilometers 70 to 90. 3,000 cubic meters.]

	Per cubic meter.
Carlos Clausells, Ponce	\$2.05
Roque Paniagua, San Juan	1.84
Juan Santiago Torres, Coamo	1.80
Nereo Pirazzi, Ponce	1.69
Wm. A. Hutton, San Juan	1.64
Ricardo G. Camba, Rio Piedras	1.58
Salas & Janes, San Juan ^a	1.54

[Section No. 8. Road No. 4. Cayey to Arroyo. 2,500 cubic meters.]

	Per cubic meter.
William A. Hutton, San Juan	\$2.44
Ricardo G. Camba, Rio Piedras	1.96
Nereo Pirazzi, Ponce	1.95
Jose Juan Vidal, Guayama	1.90
Roque Paniagua, San Juan	1.85
Salas & Janes, San Juan	1.84
M. Munitiz, Cayey ^a	1.83

^a Contract awarded.



MOCA-SAN SEBASTIAN ROAD. ROLLING SECOND COURSE OF MACADAM.

[Section No. 9. Road No. 6. Ponce to Adjuntas. 2,000 cubic meters.]

	Per cubic meter.
Carlos Clausells, Ponce	\$1.97
Nereo Pirazzi, Ponce	1.79
Ricardo G. Camba, Río Piedras	1.74
Roque Paniagua, San Juan	1.74
William A. Hutton, San Juan	1.73
Salas & Janes, San Juan "	1.69

The delivery of the stone contracted for was immediately begun, but the heavy rains prevailing about that time seriously interfered with the work, and it was not until the dry spell of January and February gave the contractors a better opportunity to push the work that most of them were enabled to deliver approximately the monthly quota agreed upon.

At the end of the fiscal year all contracts had been closed. Three of the contractors have furnished the full amount called for by the contracts; one failed to make prompt delivery and his bondsmen were authorized to proceed with the contract; they, however, and three other contractors, were unable to furnish the quantities contracted for, and the state of the contracts when closed was as follows:

TABLE No. 6.

Contractors.	Section.	Amount contracted for.	Amount delivered.	Deficiency.
		<i>Cubic meters.</i>	<i>Cubic meters.</i>	<i>Cubic meters.</i>
Carlos de Ereño	San Juan, 21 kilometers	6,000	4,565½	1,434½
Do.	Kilometers 22 to 48	7,000	4,142	2,858
Do.	Río Piedras to Mameyes	6,000	4,871½	1,128½
R. G. Camba	Kilometers 49 to 69	5,000	795	4,205
M. Muníiz	Cayey to Arroyo	2,500	1,900	600
Salas & Janes	Kilometers 70 to 90	3,000	3,243+	243
Do.	Ponce to Adjuntas	2,000	1,757-	243
I. Sanchez	Cataño to Toa Alta	2,000	2,000	None.
A. G. Canton	Toa Alta to Corozal	1,000	1,000	None.

Considering the prices paid for stone during previous years, those paid the past fiscal year are comparatively low, and were rather surprising in view of the exorbitant prices asked for two years ago at the time the money basis was suddenly changed. It is an indication that economical conditions are resuming a more natural basis. Every effort was made to place as much of the stone contracted for upon the roads as was possible with the tools on hand. There was a great deficiency in the latter, particularly in road rollers. Those on hand were principally old-fashioned patterns, and too light, having been made of rollers formerly used for crushing sugar cane, and very small in diameter, whose efficiency was very little increased by the addition of a wooden box filled with stone.

Eight large and modern horse road rollers were purchased at wholesale prices of American contractors who were leaving the island. These were principally required, however, for work on new roads. Two additional steam rollers were obtained from the United States and were specially assigned for work on the San Juan-Ponce road, upon which at the end of the fiscal year three steam rollers, including the one purchased the previous year, were at work. Besides these three, another steam roller, belonging to private parties, has been rented and has been at work on the Arecibo-Ponce road near Arecibo since April last. The great advantage in every way of steam rollers over those drawn as heretofore by oxen has become more and more apparent, and it is contemplated to continue their introduction and to augment their number until their distribution is so adjusted that each one can be kept steadily at work throughout the year on the principal roads of the island.

“ Contract awarded.

14 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

The number of cubic meters of broken stone placed upon the roads by the regular force during the year was 25,672, of which 17,402 cubic meters were placed in the North Division and 8,270 cubic meters in the South Division, distributed as follows:

TABLE No. 7.

North division:

Road No. 1—	Cubic meters.
San Juan to kilometer 21	4, 783
Kilometer 22 to kilometer 48.....	3, 613
Kilometer 49 to kilometer 69.....	1, 973
Road No. 2. Cataño to Toa Alta.....	1, 902
Road No. 7. Río Piedras to Mameyes.....	3, 671
Road No. 10. Toa Alta to Corozal	1, 000
Aguadilla to San Sebastian.....	300
Cidra to Las Cruces.....	160
Total	17, 402

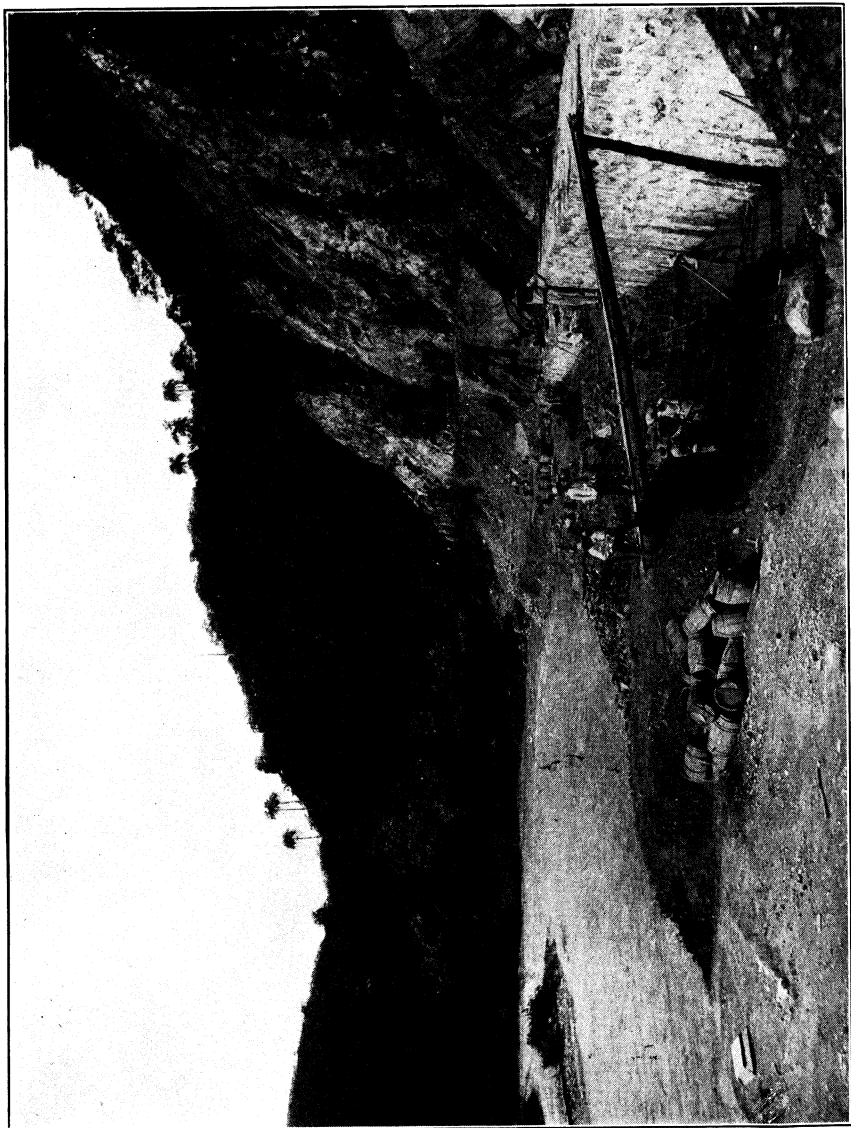
South division:

Road No. 1—	
Kilometer 70 to kilometer 90.....	1, 300
Pezuela Bridge to Añasco.....	5, 000
Road No. 4. Cayey to Arroyo.....	525
Road No. 6. Ponce to Adjuntas	1, 445
Total	8, 270

According to the conditions of the roads, which in many cases were completely worn down to the bottom course, the thickness of new metal put on varied from 7 to 13 centimeters, the width covered being invariably 5 meters. Including hauling and spreading stone and screenings, and sprinkling and rolling the same, the average cost of placing 1 cubic meter was 62 cents; or, adding the average cost of the stone, \$2.25 in all. The cost of labor being about the same throughout the island, except in the vicinity of San Juan, the final cost is very much determined by the charges for hauling, ox-team hire, and the price for stone, the latter depending greatly upon accessibility to the quarries, their distance from the point of delivery, and the quality and the hardness of the stone to be broken. It is expected that the primitive methods still obtaining in producing macadam and in transporting it will soon be eliminated by the introduction of stone crushers and portable tracks, as used elsewhere, which would undoubtedly reduce the unit price. To encourage such a change, however, and to compensate for the first outlay in comparatively expensive machinery, it would be advisable to make one contract annually for all the stone required instead of letting it in small blocks as has heretofore been customary.

Besides the placing of new macadam and the varied minor routine work done by the regular road force in the maintenance of roads, its labor was much augmented the past year by the removal of the many landslides which have taken place on the older roads during the unusually protracted periods of heavy rain which prevailed in August, September, October, November, and December, 1901, and during April, May, and June of this year. At kilometer 68, between Cayey and Aibonito, where the road is located upon a very narrow side cut excavated into the slope of a high and precipitous mountain whose foot is washed by the La Plata River, tons of material, consisting of decomposed limestone, are continually dislocated every rainy season, obstructing traffic and requiring the employment of a special gang of men to keep the road clear. The material removed and forming the embankment is, however, continually washed away again by the river, and the only remedy lies in the construction of a revetment wall following the river below and a high retaining wall along the mountain side of the road. At kilometer 86 of the same road is a similar point giving continual trouble by the dislocating of large blocks of granite bedded in fissures of softer material and which slide down after heavy rains. There is a possibility in this case, however, that the eventual exhaustion of material from that source will put a stop to it. On the road between Cayey and Arroyo are several points where landslides are continually taking place, but they are not so extensive.

The law regarding the protection and guarding of roads heretofore in force was amended in a few unimportant points by the last legislature. The principal change made refers to the presentation of complaints and the collection of fines. The former are to be made hereafter before the police judges instead of before an alcalde; the latter are to be imposed in accordance with the new penal code. This method is



ARECIBO-PONCE ROAD. RETAINING WALL AT CANIACO UNDER CONSTRUCTION.

much simpler when compared with the old one, where the accuser received one-third of the fines collected, the alcalde another third, and the remaining third was held and deposited in a fund reserved for the improvement of roads.

I have to reiterate my statement made in previous reports in reference to the comparatively high cost of maintaining the roads, that I believe, after the present extensive and unusual repairs made necessary by neglect dating back to before the war are finished and the general condition of the roads has assumed a more normal aspect, their maintenance will be less expensive to the Government if done by contract covering a period of a year or a series of years. With rigid specifications and exercising a constant and intelligent inspection, the results I am certain would be more satisfactory than now.

2. *Construction of new and reconstruction of old and unfinished roads.*—Under this head is comprised all the actual new and important repair work carried on during the year by contract and day labor, either with appropriations from the regular budget or with allotments from the so-called "trust fund." It will be well to enumerate them chronologically in the order in which they were begun, giving those completed first and closing with those still in progress or unfinished at the end of the fiscal year.

(1) *Arecibo section of the Arecibo-Ponce road.*—This section, about 12.8 kilometers long, was commenced under the military government in February, 1900, under a contract made with a New York firm. The first appropriations for its construction were made from insular funds. These were not sufficient to complete the work as originally contemplated, and after they had been expended the contract was discontinued. An allotment of \$42,726 from the trust fund was subsequently made to complete the work left unfinished under the previous contract, and the recommendation to do this by day labor was approved. At the beginning of the fiscal year work had just been started, but it was carried on vigorously during the following months and was practically completed in December last at a cost of \$41,411.18.

The southern end of this section had been nearly completed for about 5 kilometers under the original contract, and comparatively little work had been done to the remainder. The work done by day labor was, therefore, in reality, equivalent to constructing over 7 kilometers of new road, the greater part of which was through a low cane country having no bottom, figuratively speaking, requiring for long distances an expensive Telford paving for a foundation. But the whole distance of over 12 kilometers was put in thorough good order at comparatively little expense, and reflects credit upon the young engineer who had charge of it.

(2) *Second section of the Manati-Ciales road.*—This section is 8.1 kilometers long, and, like the preceding one, had been commenced by the military government and partly finished under a contract with the same company referred to therein, with funds appropriated from the insular budget.

At the beginning of the fiscal year an allotment of \$49,680 had been made from the trust fund to complete it by day labor, and work had just commenced. The road was finished in December last, at a total expense of \$30,885.46. The balance of the allotment, which is still on hand, is to be expended in erecting the large iron bridge across the Manati River, for which preparations are in progress.

(3) *Caguas-Humacao road.*—This road, passing through the towns of Gurabo, Juncos, and Piedras, is 36.2 kilometers long, including the section from Humacao to Humacao Playa. It was received from the military engineers in an unfinished state, all the grading having been done and considerable macadam. An allotment of \$65,000 was obtained from the trust fund to complete it, and it was decided to do part of the work by contract and part by day labor. A contract was made with Marix & Co., of San Juan, to complete the three middle sections of the road situated between Gurabo, Juncos, Piedras, and Humacao, respectively, for the lump sum of \$44,250, using as a basis the quantities and labor required as determined by a detailed examination and estimate made shortly before the work commenced. The length of the road covered by the contract was 20.2 kilometers. Work was begun in December, 1901, and was finished in June, 1902, having been much delayed by the heavy rains. At many points the sub-bed had become so soft that macadam could not be placed upon it except at a great loss, and it became necessary to lay first a telford pavement. The drainage along the road was also found insufficiently provided for in the original project, which required the construction of additional culverts, drain pipe, and dry retaining walls, and the excavating of extra ditches. The total amount expended under the contract was \$52,914.33. The balance of the allotment was applied in repairing and maintaining the two end sections of the road near Caguas and Humacao Playa, the last named one particularly requiring much attention, as the culverts were old and the macadam only a few inches in thickness. A new bridge of 5.50 meters span was built on the Playa section in place of an old, large, brick culvert destroyed about a year ago, with an allotment of \$1,800 from the trust fund.

(4) *Defendini section of the Arecibo-Ponce road.*—This section comprises the last unfinished portion between Ponce and Adjuntas, and begins at kilometer 15 of the old road built northward beyond Ponce, and joins the new road recently extended southward from Adjuntas at a point near the top of the mountains, called "Defendini." Its length is 5.93 kilometers, 3 kilometers following the old Adjuntas road, the rest being an entirely new line. A resurvey which was in progress at the beginning of the fiscal year was completed some time in August, and a project having been made and approved, an allotment of \$90,000 was obtained from the trust fund, the work to be done by contract.

The following is an abstract of bids received for this work on December 31, after proposals had been invited by public advertising:

TABLE No. 8.—*List of bids for the construction of 5.93 kilometers of road No. 6, "Defendini" to kilometer 15, opened December 31, 1901.*

Gandia Hermanos, San Juan	\$91,416.85
Carlos Clausells, Ponce	85,142.87
Marix & Co., San Juan	81,897.50
Mullenhoff & Korber, San Juan	77,124.35
Carlos de Ereño, San Juan	76,627.59
Roque Paniagua, Ponce ^a	66,139.85

The contractor immediately began work and, favored by fine weather which prevailed during the first three months of the present year, made considerable progress. At the end of the fiscal year nearly all the grading and excavations had been made and about two-thirds of the masonry work had been constructed, and preparations were in progress to spread the macadam. The recent rains, however, have slightly interfered with the work. It is expected, however, that the contractor will complete the contract as agreed upon by October 4, 1902.

(5) *Rio Chico section of the Arecibo-Ponce road.*—This is a section beginning 10 kilometers south of Utuado and extending for a length of 5.22 kilometers to a point called "Vuelta de los Tallones," joining on both ends with unfinished portions of roads built by the military engineers. Its route lies principally along the old Utuado-Adjuntas trail and no work had been done thereon before. From a survey made at the beginning of the fiscal year a project was prepared and approved and the work was ordered to be done by contract, with an allotment of \$74,000 made from the trust fund. In response to the usual advertisement the following bids were received:

TABLE No. 9.—*List of bids for the construction of 5.22 kilometers of road No. 6, between Adjuntas and Utuado, opened February 6, 1902.*

Gandia Hermanos, San Juan	\$77,559.35
Roque Paniagua, Ponce	73,407.19
Mullenhoff & Korber, San Juan	68,298.29
Jose Roig Colomer, Utuado	58,740.08
Marix & Co., San Juan ^a	54,903.94

Work has been in progress since the latter part of February, and at the end of the fiscal year about three-fourths of the grading and excavation and nearly one-third of the masonry work had been done. With the exception of delay caused by several unexpected landslides, the work is progressing well and is expected to be finished by the time fixed upon on the contract, viz, August 28, 1902.

(6) *San German and Pezuela Bridge section of the Mayaguez-Ponce road.*—This section, which is 6½ kilometers long, had never been in charge of the public works, having been built by municipalities before the war. Its condition had become wretched by neglect, and as it is an important highway and connects at Pezuela Bridge with a finished portion of the same road leading into Mayaguez, which is being maintained by this bureau, orders were given last January to repair it, the expenses to be defrayed with an allotment of \$10,000 made from the "trust fund." The repairs were done by day labor under the supervision of three experienced "sobrestantes," and were finished in April. Over 3,000 cubic meters of broken stone were placed, requiring at many and the most miry points large block stone for a foundation. A thorough drainage was provided along both sides of the road and the road was left in good order after the allotment had been expended. Since then it has been temporarily taken care of until it will be placed in charge of the regular road force.

^a Contract awarded.

(7) *Yabucoa-Maunabo road*.—A detailed survey for a new road following the old trail over the mountains at La Pandura was made early in the year, and subsequently a preliminary examination for another route following for a certain distance in close proximity to the seashore, but the latter having been found too circuitous and considerably longer than the former, a project was submitted and approved along the first-named route for a second-class road with 3 meters of macadam, at an estimated cost for the whole length, which is 9.36 kilometers, of \$38,000. The work was ordered to be done by contract and the allotment, as estimated, having been made from the trust fund, the following bids were received on April 16, 1902, in response to the usual advertisement.

TABLE NO. 10.—*List of bids for the construction of 9.36 kilometers of road No. 7, Yabucoa-Maunabo, opened April 16, 1902.*

Roque Paniagua, Ponce.....	\$45,159.65
Carlos Clausells, Ponce.....	38,829.59
Marix & Co., San Juan.....	34,155.40
Demetrio Garofalo, Humacao ^a	30,799.52

Work was commenced in May last and is now in progress. About 10 per cent of the whole contract had been accomplished at the end of the fiscal year.

(8) *San Sebastian-Lares road*.—This is an extension of the first-class road already finished between Aguadilla and San Sebastian. A survey had been ordered and was in progress at the beginning of the fiscal year and was finally completed in October last. The route follows practically the old trail to Lares, with slight "variantes" introduced at such points where an easier grade was required. Its total length is 14.7 kilometers. On account of the large expenditure involved it was decided to build only a second-class road 5.68 meters wide, to be covered with 3 meters of macadam, but this original order was subsequently modified and the macadam increased to 4.5 meters in width. Nearly all the broken stone required therefor was already available, having been purchased and stored near the route by the military engineers two years ago. The project having been approved, an allotment of \$75,000 for the construction of the road in accordance therewith was set aside from the "trust fund," the work to be done by contract. The work was advertised in two sections, one 6 and the other 8.7 kilometers long, the estimated value of each being nearly equal.

The bids received were as follows:

TABLE NO. 11.—*List of bids for the construction of 14.67 kilometers of road No. 8, San Sebastian-Lares, kilometer "0" to kilometer 14.67, opened March 19, 1902.*

Section 1, kilometer "0" to kilometer 6:	
Carlos Clausells, Ponce.....	\$45,243.15
Marix & Co., San Juan.....	41,602.48
Roque Paniagua, Ponce.....	37,358.78
Section 2, kilometer 6 to kilometer 14.67:	
Marix & Co., San Juan.....	39,705.74
Roque Paniagua, Ponce.....	36,760.56

Lowest bid, exclusive of 11,554 cubic meters of broken stone furnished by bureau of public works, \$74,119.34.

The aggregate of the lowest bid being higher than the original estimate and the allotment made for the work, it was decided to reject these bids and to advertise again. The second set of bids received were considerably lower and were as follows:

TABLE NO. 12.—*List of bids for the construction of road No. 8, San Sebastian-Lares, kilometer "0" to kilometer 14.67, opened April 23, 1902.*

Section 1, kilometer "0" to kilometer 6:	
Roque Paniagua, Ponce.....	\$41,827.46
Marix & Co., San Juan ^a	39,517.11
Section 2, kilometer 6 to kilometer 14.67:	
Roque Paniagua, Ponce.....	42,940.34
Marix & Co., San Juan ^a	38,798.57

Lowest bid \$78,315.68, including 11,554 cubic meters of broken stone, at \$1, furnished by bureau of public works, making net bid \$66,761.68.

^a Contract awarded.

The engineers and the contractors were in the field at the end of the fiscal year preparing to begin actual operations.

(9) *Fajardo-Naguabo Playa road.*—The demand for the repairs of this road, which constitutes the only outlet for a large and prosperous sugar-cane region, were very great. It was originally built by the municipalities interested therein, and by neglect extending over a series of years had become almost impassable. An allotment of \$10,000 was made from the "trust fund" to put the road in good order at points requiring immediate attention, including the regulating of the roadbed and drainage along the whole line.

The distance between Fajardo and Naguabo Playa is 18 kilometers. The repairs, which are being done by day labor, were commenced in April last under the supervision of several sobrestantes and are still in progress, about \$8,720 having been expended at the end of the fiscal year.

(10) *Yauco and Sabana Grande section of the Mayaguez-Ponce road.*—With a view of reconstructing it, a survey of this section was ordered and made last year, followed by a survey of another section of the same road located between Sabana Grande and San German. This was done to obtain complete information about the present condition of the whole road between Yauco and Mayaguez, the section between San German and Pezuela bridge, where the finished road begins, having previously been surveyed. The survey showed that the section between Yauco and Sabana Grande was in immediate need of improvement, and a project having been submitted therefor an expenditure of \$61,782 from the trust fund was authorized for that purpose in March last.

The section is 16.2 kilometers long, and was heretofore a municipal road. Its maintenance had been entirely neglected, the roadbed having become impassable except in dry weather, but most of the old culverts were found in fairly good condition. It was decided to repair the old culverts and to construct new ones and additional drainpipe where needed by contract, and subsequently to finish the road by day labor. The construction of the culverts, etc., was advertised for, and in response thereto the following bids were received:

TABLE NO. 13.—*List of bids for the construction of auxiliary works, road No. 3, Yauco-Sabana Grande, opened June 3, 1902.*

Victor Honoré, Mayaguez	\$15,503.80
Andres G. Canton, Corozal	12,944.68
Carlos Clausells, Ponce	10,935.67
Marix & Co., San Juan ^a	10,568.50

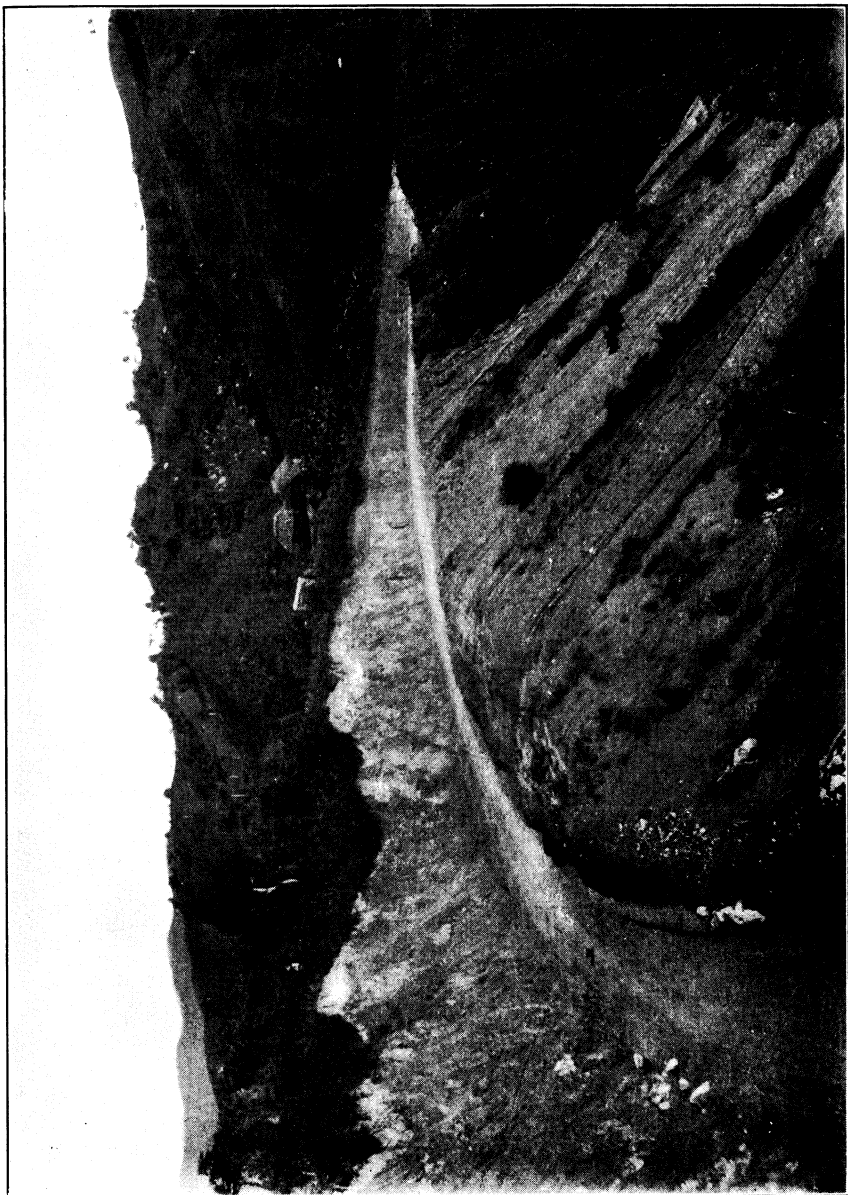
At the end of the fiscal year actual construction work had not yet been begun, but the contractors were preparing the material for the masonry.

(11) *Repairs of the Morovis road.*—The construction of this road had been begun under a contract by the military government. It was classed as a country road, 5 meters in width, and was only partly finished when work was suspended under the original contract in April, 1901, on account of lack of funds. Its length is 12 kilometers from the junction with the Manati and Ciales road to the town of Morovis, where it ends. In view of the great distance and cost involved in building this somewhat unimportant branch road into a region which had no particular preferences over others, nothing had been done to it since the first work was ordered to be discontinued. Much of the grading was done; several expensive concrete culverts and two large concrete abutments for a long-span iron bridge across Morovis River had been built; the principal work now required was the placing of broken stone and necessary drainage. To prevent the work already done from going to ruin it was decided to put a force of men on the road and to do such work as could be done toward its completion with funds from the regular budget. Since last April several hundred men have been employed under the direction of a sobrestante in breaking and placing stone and in grading and cleaning ditches.

At the end of the fiscal year \$9,000 had been thus expended in finishing the grading for a length of 6 kilometers and spreading stone for a length of 5.4 kilometers. Besides this, 9,000 linear meters of ditching was done, one culvert and one dry retaining wall were constructed, and about 1,200 cubic meters of broken stone were stored away in addition to what was used on the road. It is expected that funds will be obtained the coming year to finish the road completely.

(12) *San Lorenzo-Caguas road.*—As stated in last year's report, this road, which is 9 kilometers long, had been repaired at a total cost of \$8,418, of which \$2,500 was from the trust fund, and as comparatively little was to be done to make it serviceable and no further allotment could be made, the municipalities of Caguas and San

^a Contract awarded.



CAGUAS-HUMACAO ROAD. "VUELTA DE LOS INGLESSES," NEAR HUMACAO.

Lorenzo were expected, and had so promised, to finish it at their own expense. Nothing having been done, however, a force of men was put to work in May to continue repairs with funds available from the regular budget; the extremely rainy weather, however, and the impossibility of hiring laborers at reasonable wages prevented the accomplishment of much work, and at the end of the fiscal year \$512.32 had been expended in placing broken stone for a length of about 430 lineal meters and cleaning 180 lineal meters of side ditches near San Lorenzo.

(13) *Camuy-Aguadilla road*.—Slight repairs at an expense of \$2,000 had been done on this road the previous year, though it had never been on the regular list of roads maintained by the island, having been built originally by the adjoining municipalities. It is, nevertheless, a much traveled highway, forming at present a connecting link between two finished sections of a railroad system which is ultimately to connect San Juan and Mayaguez. The distance between Camuy and Aguadilla is 41 kilometers. The road passes over comparatively level ground affording easy grades, and if once put in good order can be readily maintained. An order was received in May last to repair the road with funds available from the regular budget appropriation, employing as many men as could be advantageously worked, to ameliorate the bad conditions existing, especially in the western portion near Aguadilla and Isabela, and at other points of the road, if time would permit. Within a few days several hundred men were at work, their number increasing gradually to an average of 1,330 per day, and on the 30th of June, when work stopped, \$18,380 had been expended, principally near Aguadilla, at the bridge across "Rio Guajataca," and at various points between Isabela and Camuy.

Considering the limited time available and the necessity for providing for tools and other material, the results of over one month's steady work were highly commendable and reflect great credit upon the sobrestantes who were in immediate charge of the work. A total of over 4.5 kilometers of road were graded and metaled at points where the road was particularly rough and, at times, almost impassable. Over 11,000 lineal meters of side ditches were opened and cleaned, 3,673 lineal meters of mud holes were filled and covered with stone, and 11 wooden culverts and 272 lineal meters of dry retaining walls were built.

Since these repairs were finished a further examination of the whole road has been ordered with the view of placing it in good order throughout.

(14) *Arecibo-Ponce road, section south of Utuado*.—This is a section 7.3 kilometers long, beginning at Utuado and following the valley of Arecibo River in a southerly direction until it joins with the section now in construction described in paragraph 5. It was located and partly begun by the military engineers, and at the time it was turned over to the civil government was about half finished, lacking principally macadam and the completion of partly finished culverts and retaining walls. A force of men has been at work for several months restoring embankments, removing landslides, attending to drainage, and placing macadam.

This work is still in progress and will soon be finished, being done by day labor. For the construction of the necessary auxiliary works sufficient funds were obtained from the regular budget appropriation to let the work by contract, and after advertising for bids the following proposals were received:

TABLE No. 14.—*List of bids for the construction of auxiliary works, road No. 6, Adjuntas-Utuado, opened June 26, 1902.*

Marix & Co., San Juan	\$8,350.40
Jose Roig Colomer, Utuado ".....	8,172.92

The contractor had begun excavating for the foundations before the end of the fiscal year.

(15) *Caniaco retaining wall and Marilla River bridge*.—Two special allotments of \$8,850 and \$12,000, respectively, have been made from the "trust fund," the first to construct a large retaining wall on the Arecibo-Utuado road, where the roadbed had been carried away by floods and landslides, the second for the construction of a masonry bridge across Marilla River on the Toa Alta-Corozal road. Proposals for the bridge were invited in September last, but those received, six in all, were considerably above the estimate and all were rejected. Since then the work has been carried on under the direct supervision from this office by day labor and by subletting certain parts of the work as the needs and interests require. At the end of the fiscal year the foundations and abutments and portions of the wing walls were up, and the false work for the arch was almost completely erected. Work on the retaining wall at Caniaco, which is being done under a special agreement, is still in progress.

(3) SURVEYS AND EXAMINATIONS FOR NEW ROADS AND BRIDGE SITES.

Of the eight surveys of country roads ordered in April, 1901, one, that between Aibonito and Barranquitas, had been completed at the beginning of the fiscal year; the others were still in progress. Besides these surveys for country roads, many others were made in connection with the preparation of projects for road work already ordered and partly commenced and in ascertaining the cost of repairs ordered on old roads which had previously not been in charge of this bureau.

The following is a synopsis of the work done in this division:

1. *Survey between Aibonito and Barranquitas.*—The distance between these towns along the line surveyed is 11 kilometers. Near Aibonito a change in the present road is proposed to avoid a very heavy grade; the rest of the route follows the old trail which the previous year had partly been made passable for vehicles by Capt. H. W. Wheeler, of the United States Army, who paid for the work in rations furnished by the commissary department and later with funds, to the amount of \$7,000, placed in his hands by special order from the governor. With these means many of the worst places on the road were improved, but much remains to be done. A project was prepared and submitted for consideration after the survey was completed and it was estimated that \$35,000 will be required to complete the road as a third-class cart road, 5.68 meters in width, 3 meters of which are to be covered with macadam.

2. *Survey between Barranquitas and Barros.*—This survey was made immediately after the preceding one had been finished. The line follows the old trail, between the two towns, the distance being $21\frac{1}{2}$ kilometers. The plotting of the field work was delayed several months, as the services of the engineers who made the survey were required elsewhere, but it is nearly finished, and, judging from the similarity between this section and others adjoining, where final projects have been made, it is estimated that the cost of constructing a narrow third-class road, 5.68 meters wide, of which 3 meters are to be covered with macadam, will not be less than \$4,000 per kilometer.

3. *Survey between Barros and Jayuya.*—On account of the great distance between these towns, which, following the lines of the old trail and the survey, was found to be 52 kilometers, two parties had been sent into the field, one working from Barros, the other from Jayuya.

The topographical features of this part of the island within the heart of the mountain region were exceedingly embarrassing and presented many difficult problems for solution to the engineers in establishing their line in accordance with instructions given. Great credit is due them, nevertheless, for what they accomplished, and after 19 kilometers had been surveyed in detail from the Barros end and 14 kilometers from the Jayuya end, sufficient data appeared to be obtained to form the conclusion that the construction of any kind of wagon road along this trail would be a very expensive one. It was therefore ordered to close the gap between the two surveys by a preliminary examination and traverse line to determine the total distance between the two towns along the existing trail, whereupon the field parties were assigned to other duties. With the data on hand it will not be very difficult in the future to make an approximately correct estimate of the cost of a road between these towns if it should be required; but its ultimate cost will certainly not be less than \$200,000.

4. *Survey between Jayuya and Utuado.*—This survey, together with that made from Jayuya toward Adjuntas described below, was ordered to be made to arrive at a decision as to the relative advantage that would accrue in constructing a road by either line from the town of Jayuya to the Arecibo-Ponce road.

The survey was completed and the field work plotted, and from an estimate made in detail it appears that a third-class road, 5.30 meters wide, covered for a width of 3 meters with macadam, between the towns named, a distance of $20\frac{1}{2}$ kilometers, would cost \$178,000.

5. *Survey between Jayuya and Adjuntas.*—This survey was commenced shortly after the field work of that from Jayuya to Utuado was completed. It was finished last January. The line surveyed is 26 kilometers long and connects with the Ponce-Arecibo road at a point called "Alto de la Bandera," about 6 kilometers south of Adjuntas. The plotting of the field work is nearly finished, but recently an approximate estimate was made for constructing a third-class cart road 4 meters wide with a broken stone covering 3 meters in width, which places its cost at \$112,000.

It appears that the general desire of the people at and near Jayuya is in favor of having this line constructed in preference to that to Utuado, on account of the greater commercial facilities centering in Ponce and the more ready access it would give them to that city. The survey further shows that the number of culverts and other auxiliary works required is less than would be needed along the Utuado route and that the road throughout would be cheaper of construction.

6. *Survey between Barros and Corozal.*—This survey was finished last March. The greater portion is over a very rough and rugged trail along very precipitous cliffs of rock. The length of the line surveyed is 28 kilometers. At the end of the fiscal year the plotting of the field work was still in progress; a rough estimate was made, however, recently, selecting from the field notes several sections indicating minimum and maximum amounts of work required for the constructing of a road 5.30 meters wide covered with macadam for a width of 3 meters, and it was found that the expense for the total distance will not be less than \$212,000.

7. *Survey between Quebradillas and Lares.*—The estimated distance along the existing trail between these towns is 16 kilometers. The survey had been ordered and was begun the previous year, but was discontinued after 12 kilometers had been surveyed from Quebradillas to a point in the mountains called "Los Puertos." From the latter point to Lares the topography of the country presents unusual difficulties for the construction of a road, the expense for which appears to be not warranted at present. For the first 10 kilometers, which follow partly along an old country road, a project was made, however, for a third-class cart road having 3 meters of macadam upon a second-class roadbed 5.68 meters wide, and the average cost per kilometer was estimated at \$2,000. The same class of road continued through the mountains would probably cost \$6,000 per kilometer.

8. *Survey between Las Marias and Lares.*—This survey was ordered with the view of extending the finished road between Mayaguez and Las Marias farther into the rich coffee district around Lares. The estimated distance between the two towns is 19 kilometers. A reconnaissance of three existing trails was made and subsequently a detailed survey of the first 3 kilometers of the one which appeared to offer the best facilities for the construction of a road, but orders were received to discontinue the survey after the Añasco River was reached and to transfer the field party to Lares to begin the survey between that town and San Sebastian.

9. *Survey between Lares and San Sebastian.*—An examination of three available routes between these towns was made before the detailed survey of the final line was commenced, and from these the one selected as the best included part of the old wagon road upon which several culverts had already been built. The length of the adopted line is 14.7 kilometers and, as previously stated, the road is now under construction.

10. *Survey between Yabucoa and Mavabo.*—A detailed survey of the old trail across the "Pandura," connecting these towns, was finished last September and the results were plotted and used in preparing the project for the road which, as stated in another part of this report, is now under construction. The length of the line surveyed is 9.36 kilometers, the greater portion of which passes through one of the most rugged mountain regions. Simultaneously a reconnaissance of another trail had been made connecting the two towns and following principally the seashore, but it was found to be over 22 kilometers long and offered no exceptional advantages for the construction of a road contemplated to further their mutual interests.

11. *Survey of the "Defendini" section of the Arecibo-Ponce road.*—This section, situated as it is within the divide of the high mountain range, had been surveyed many times before, during the Spanish times and subsequently, and had presented unusual obstacles to a satisfactory solution for the construction of an economical modern road.

As the building of the latter could not be deferred any longer, the locating of the final route was given in charge of the most talented surveyor in the bureau, who solved the question most creditably. The requirements of the survey were especially complicated, inasmuch as the line was to pass over a limited region, connecting at both ends with the sections of roads already built. The length of the line surveyed was 6 kilometers, and the road is now, as previously reported, under construction.

12. *Survey of the Rio Chico section of the Arecibo-Ponce road.*—This was also a special survey and embraced, excepting the "Defendini" section first described, the last undeveloped portion of the Arecibo-Ponce road where no final surveys had been made and where, in consequence, no work except ordinary repairs of the trail had been done. It joins two sections of unfinished roads begun under contract by the military engineers. No unusual difficulties were encountered in this survey, which covered a distance of 5.22 kilometers, and from which the necessary data for a project were obtained upon the lines of which the road is now being constructed as described in a previous part of this report.

13. *Survey of the road between Yauco and Sabana Grande.*—The survey of this portion of the Mayaguez-Ponce road, which was in very bad condition from long neglect, was ordered last year with the view of reconstructing it, similar in manner as the section of the same road situated between Pezuela bridge and San German, which had recently been put in good order. As the distance is 16½ kilometers and the survey was to cover also the section of the road lying between Sabana Grande and

San German, an additional length of $8\frac{1}{2}$ kilometers, two field parties were sent out, who finished the field work in February.

A detailed project was subsequently prepared covering both sections, but as the section between Sabana Grande and San German was held to be in fairly good condition, requiring probably hereafter only a close supervision in maintaining it, an estimate for the reconstruction of the Yauco-Sabana Grande section only was submitted, which was approved, and the work is now in progress, as stated in another part of this report.

14. *Survey between Bayamon and Comerio.*—Of the total distance between these towns, which is 27 kilometers, the upper 5 kilometers, near Comerio, consist of a partly finished road built during the Spanish times and by the United States military government. Of the remaining distance, following the old trail, 12 kilometers had been surveyed by the military government and $6\frac{1}{2}$ kilometers recently by this Bureau, leaving $3\frac{1}{2}$ kilometers adjoining the road near Comerio to be surveyed. The field parties, who had commenced last February, were called in after completing $6\frac{1}{2}$ kilometers of the survey for the purpose of preparing a preliminary estimate, which was to be submitted with the view of obtaining an early appropriation for the construction of the road. An approximate estimate was prepared, covering the whole line, 22 kilometers in all, and the unfinished work near Comerio, and it was calculated that a second-class road having a width of 5.61 meters and 4.8 meters of macadam would cost about \$275,000. It was decided subsequently to reduce the width of the roadbed as given in the first estimate to 5.30 meters and to place only 3 meters of broken stone upon the same, as fulfilling in every respect the present needs of traffic on the proposed road, and to build only 12 kilometers along the most difficult portions of the line, connecting near Comerio with the section already built. An allotment of \$120,000 was made from the "trust fund" for that purpose, and the project is now in preparation.

15. *Surveys of certain sections of the Arecibo-Ponce road.*—Besides the special surveys which were being made on this road for the development of entirely new work at the "Defendini" and "Pellejas" line, referred to before, a resurvey of the whole line, excepting the 15 kilometers of finished road near Ponce, was made during the past year, and the field work is now being concluded. This work was absolutely necessary for the purpose of arriving at a proper knowledge of the state and condition of those sections of this road which had been built and were turned over to the civil government more or less unfinished and half completed by the military government. The examination extended from near Arecibo to Adjuntas, for a total distance of 32 kilometers, 18 of which were entirely resurveyed in detail.

The results show that in the matter of macadam, constructing additional and finishing partly commenced culverts and drainpipe, building and extending retaining walls and breastworks, and trimming and securing slopes, a great deal of work has yet to be done. The sections particularly affected are situated north and south of Utuado and north of Adjuntas, for which additional appropriations have to be made before they can be designated as finished roads. The estimates have partly been made, including the cost of constructing several necessary bridges, and at the end of the fiscal year the survey party was concluding its labor by making studies for a short change in the line just south of Adjuntas, in order to avoid the construction of two expensive bridges.

16. *Examination of road between Trujillo Alto and Rio Piedras.*—Orders were received in August last to examine this road and to submit a rough estimate of the probable cost of putting it into fair condition for the use of carts. An engineer was sent over it, who reported that \$8,397 could be expended to advantage widening the road, which is 7 kilometers long, to 4.50 meters, providing proper drainage without any material grading, and placing 3 meters of macadam upon it.

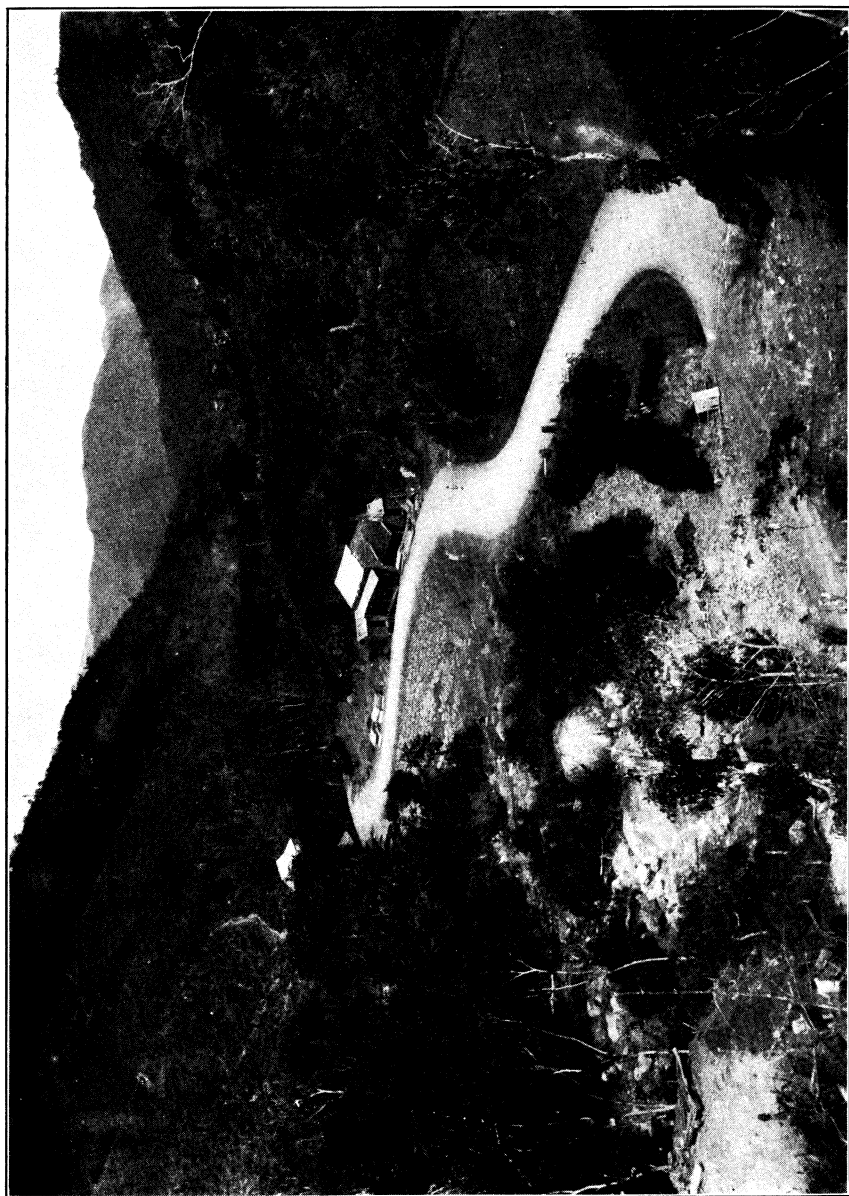
The importance of improving this road lies in the fact that near Trujillo Alto are located extensive quarries of most excellent building stone, the smaller fragments furnishing the best broken stone for the roads near San Juan.

17. *Examination of the road between Arroyo and Patillas.*—An order was received last September to make a report upon the condition of this road, which passes through an extensive cane region. Its length is 6 kilometers, its width nearly 8 meters. An estimate was made after the road was examined by an engineer, which placed the cost of the necessary repairs at \$9,123, of which \$7,850 alone are necessary for metalting. Many culverts have already been constructed, which are in good condition.

This section forms an important link in the principal road encircling the island.

18. *Examination for new bridge site across the Rio Grande de Loiza at Carolina.*—By special order a very thorough and detailed survey was made of the approaches to the river in the vicinity of the old bridge which was destroyed many years ago. The survey embraced over 1 kilometer of the shore topography, principally north of the





ADJUNTAS-PONCE ROAD. FINISHED ROAD, LOOKING NORTH FROM "LA BANDERA."

former location of the bridge, the results developing a better site available near the town. Plans and estimates were made for a low submerged wooden bridge, about 100 meters long, which can be constructed for \$10,000. If of iron and erected upon screw piles, a similar bridge would probably cost \$18,000.

RECOMMENDATIONS AS TO ROADS AND BRIDGES WHICH ARE AT PRESENT NEEDED.

In the absence of a legally fixed plan to be followed in constructing new roads, it is impossible at present to make any definite recommendations as to where and when they should be built. I refrain, therefore, from making any itemized suggestions on that line in this report and propose to wait for the time when a general plan for improvement can be formulated after the county road law enacted by the last legislature has been established upon an organized basis and is in force. The apportionment of such roads as can be placed in charge of the public works will then be an easy matter and the construction of new roads may then proceed systematically upon an approved plan adopted and legalized by the people themselves. The road plan adopted by the Spanish Government will in a great measure be useful in devising a new system; but this bureau has already in previous reports referred to the necessity of classifying the roads, in accordance with the requirements of the locality and the traffic, into first, second, and third class roads, adopting 6 meters, the invariable width of the Spanish roads, for first-class roads only.

Whatever plan may finally be adopted, it is my opinion that the three principal roads of the island—the road between San Juan and Ponce, the road between Arecibo and Utuado, and the road which encircles the whole island, connecting the seaports and principal towns of the exterior lowlands and foothills—should be finished as early as possible, and should remain ultimately in charge of this bureau.

I would call attention to needed legislation regarding the portions of the principal public roads situated in or passing through towns and villages, the so-called "travesias." The law should be made uniform upon this point, compelling all of them to be maintained either by the bureau of public works or by municipalities in whose jurisdiction they are. The latter certainly would be most advisable, as all the property in the built-up portions of these "travesias" is taxed and governed by these municipalities, and the road itself, assuming the character of a street, is subject to continuous changes and repairs by municipal improvements.

It is also recommended that as soon as financial and economical conditions warrant it, the sections of road No. 1, from San Juan to the outer limit of Santurce, and between Ponce and Ponce-Playa, be turned over to the respective municipalities for maintenance, as being entirely within the present city limits of these towns. The traffic on these sections is to a great extent a local one, greater in volume than on any ordinary highway, increasing the expenditures for maintenance beyond all proportion when compared with other sections of the same road.

The congested traffic upon the only public road leading into San Juan needs relief. Collisions are of daily occurrence in Puerta de Tierra and Santurce, and the life of pedestrians who have to walk in the middle of the road, as there are no sidewalks, is in continual danger. This need was already recognized before the war, after, unluckily, a concession had been given to a railway company to lay its tracks upon this highway, and several propositions were made to build one or more parallel roads through the suburbs, reserving one or the other for heavy traffic only.

On account of the low elevation of Road No. 1 between Juana Diaz and Ponce, which exposes it to submergence and torrential floods after every heavy rain, making it impossible to cross the many broad river beds, unprovided with bridges, over which it passes, attention is called to the possibility of avoiding these serious interruptions on the most important road of the island by constructing a new road along a line north of the present one, following the foothills from the new bridge over the "Guayo River" and entering the city of Ponce on the north side. The expenses for maintenance and bridges would certainly be considerably less than on the present road.

The development of a cart road running east and west across the middle of the island and connecting the towns of Aibonito, Barranquitas, Barros, Jayuya, Adjuntas, Maricao, and Mayaguez may also be demanded in the near future. The fluctuation in the price of coffee prevailing sometimes at the different seaports warrant the coffee growers to ship their product to other points than those which are nearest and most convenient to them, and roads are required to reach readily in any direction any market where the best prices can be obtained.

It has been obvious, since the cyclone of August 8, 1899, and since the completion of the many new roads constructed during the past three years, that something must be done to reconstruct important bridges which were destroyed and which are needed

along the principal highways. Upon the new roads only a few bridges of small span were built; the construction of the larger bridges required was postponed until the financial condition of the treasury of the island could withstand the heavy drain involved in paying for that class of public works. The heretofore primitive manner in use of fording a river may still be continued on second and third class roads with impunity, where time is of little moment, but on the principal roads, the so-called trunk lines, with their rapidly developing traffic, including transporting express and mail matter and passengers by means of tramways and automobiles, communication throughout their full lengths should not be exposed to occasional interruptions for the want of bridges. The fords at present constitute the weak links in the chain of beautiful roads which have been built.

The bridges mostly needed, and for which provision should be made in the order in which they are given, are as follows:

	Meters.
1. Rio Cagnitas, near Caguas, approximate span.....	35
2. Rio Grande de Loiza, at Carolina, approximate span.....	140
3. Rio Plata, near Toa Alta, approximate span.....	90
4. Rio Arecibo, at Utuado, approximate span.....	42
5. Rio Arena, near Utuado, approximate span.....	12
6. Rio Chico, near Utuado, approximate span.....	20
7. Rio Pellejas, near Adjuntas, approximate span.....	20
8. Rio Grande de Loiza, between Caguas and Gurabo, approximate span.....	90
9. Rio Valenciano, Juncos, approximate span.....	45
10. Rio Grande, near Rio Grande town, approximate span.....	40
11. Espiritu Santo, near Rio Grande town, approximate span.....	35
12. Rio Guatemala, near San Sebastian, approximate span.....	12

The material that can be most economically used in the construction of these bridges is iron, but some can be built with advantage of concrete and of masonry; no effort is therefore made herein to give any approximate cost of them until the necessary local studies have been made in each case.

(2) PUBLIC BUILDINGS AND GROUNDS.

The work of this division consisted during the past year in repairing and maintaining such public buildings as were claimed to be insular property. Of the twenty-seven buildings on the official list and for which special appropriations had been asked for and made, only fourteen were taken charge of and more or less repaired, the rest, principally custom-houses, could not be repaired, as the United States custom service claimed a certain jurisdiction over them and hesitated to accept insular assistance.

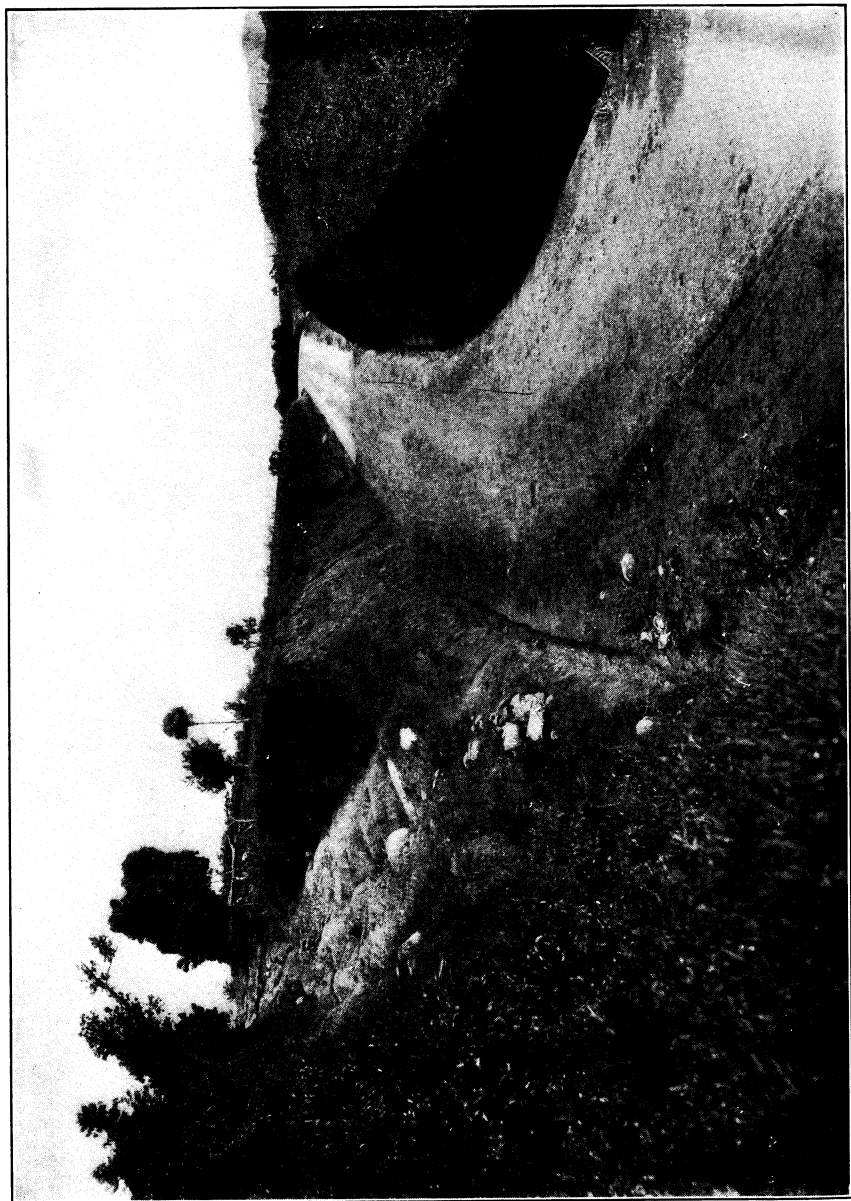
The demand for more room by the different departments of the Government was as great during the past year as the previous year, and many changes were made calling for extensive rearrangements in the available buildings. Prominent amongst these was the moving of the executive council from the palace to the rooms formerly occupied by the board of public works in the "Diputacion Building," several rooms of the latter being at the same time assigned to the director of prisons, who had been formerly located at No. 3 Fortaleza street; the transfer of the public works offices to No. 3 Fortaleza and of the United States court from the Beneficencia to No. 5 Fortaleza, and the removal of the insular telegraph bureau to the Diputacion Building.

It is believed that the needs of the service are thus provided for for some time to come. It is already apparent, however, that before long a large, commodious and modern insular building will be necessary, where all the departments should be placed under one roof to facilitate the transaction of public business.

The repair and other work as done in detail during the past year, and as reported by the superintendent of public buildings, is as follows:

Executive mansion.—New electric-light wiring complete, with electric call-bell system in offices; light, fixtures and chandeliers repaired and installed; general repairs to plumbing, including new bathroom with tub, closet, and hand basin, complete; dining, breakfast, and other rooms, repainted, decorated, and improved; general and extensive repairs to balconies, shutters, doors, and fixtures; new drainage system for music pavilion and garden; reconstruction of garden walls, paths, and beds; construction of new entrance with marble steps in hall, and general repairs to furniture and to governor's coach, and to harness of state horses; installation of water meters and the improvement of general condition of building throughout the year \$12,433.52





CAGUAS-HUMACAO ROAD. NEW ROAD LEAVING OLD ROAD NEAR LAS PIEDRAS.

Construction of fireproof vault in office of secretary of state	\$971. 77
Permanent repairs.....	1, 281. 99
<i>Insane asylum.</i> —Installation of new and enlargement of old plumbing system, and placing of additional bathrooms, wash basins, and toilets; remodeling and extension of entire water supply system, including new bell traps in cells; construction and repair of sewer and sewer connections with vent stack and surface drains; laying of cement floors in cells and outside corridors and repairs to roof; construction complete of fifteen new cells in men's department, and installation of water meters.....	3, 527. 64
<i>Institute and chapel.</i> —Extensive repairs to, and painting of, metal roof; remodeling and installation of sanitary plumbing system, including extensive toilets, urinals, and sinks; construction of new 6-inch sewerage system with basins and yard sinks, resetting and drainage of wash tubs, and installation of water meters.....	3, 076. 75
<i>Diputacion.</i> —Construction of new tile roof, with hard wood beams over hall of delegates, and new floor in attorney-general's office; new safety beams in printing office, and repairs and maintenance of plumbing system; installation of water meters and painting of offices in post-office department, together with general repairs on roof	2, 919. 79
<i>Fortaleza No. 3.</i> —Offices repaired, painted, and provided with awnings, cement floors, electric lights, and call-bell system; wooden partitions removed and remodeled with new doors, partitions, and hand rails; walls, ceiling, and woodwork painted and whitewashed, and toilets, urinals, and sinks installed; dark room constructed, and cement walk laid; general repairs to doors, shutters, and blinds; in residence portion—extensive repairs to roof, electric-light wires and call system installed, shutters painted and repaired, and windows provided with awnings; drain pipe laid for kitchen and new brick range built; general repairs to cement coating of outside walls	1, 923. 25
<i>Intendencia.</i> —General repair and extension of electric-call system. Additional electric-light wiring. Painting and kalsomining where needed. New floors in offices and rooms, and repair and maintenance of plumbing system. General repairs to roof. Contract made for steel shelving in treasurer's and auditor's vaults.....	1, 250. 00
<i>Audiencia.</i> —General repairs to roof over supreme and district courts, including replacing of and repairs to defective roof beams. Installation of complete toilet in supreme court chambers. New floors and toilets for clerk's offices, supreme court. Construction of additional stairway. Removal of old and construction of new partitions; remodeling interior arrangement of building, and creating additional rooms for court uses. General repairs to doors, shutters, and blinds, and erection of flagstaff on building.....	1, 064. 91
<i>Girls' charity school.</i> —Extensive repairs to roof; reconstruction and repair of arches in dormitories, and installation of toilets and sinks, with general repairs to entire plumbing system. Outside door gutters, woodwork of galleries, and roof painted and repaired, and new iron flues placed in kitchen.....	924. 72
<i>Fortaleza No. 5.</i> —Walls plastered, whitewashed, and partitions and wood finish painted; alterations made in partitions and new floors in rear board of health offices; repair of doors, shutters, and blinds; installation of electric-light system, sanitary sinks placed in kitchen, and water meters installed	748. 78
<i>Vaccine station.</i> —Outhouses repainted and repaired, and entire building painted; 8,000-gallon water tank erected, and water connections made with kitchen; old cesspool filled and new closets constructed and placed in use	483. 64
<i>Lepor hospital.</i> —New iron roof and new doors and partitions placed in boatmen's quarters; cistern cleaned and repaired, and all outside doors, shutters, and blinds throughout furnished with best quality brass hardware	471. 53
<i>Beneficencia.</i> —Extensive and permanent repairs to roof; installation of water meters and general repairs to, and in some cases entire reconstruction of, partitions and floors.....	395. 52
<i>Penitentiary.</i> —Extensive repairs to roof, including safety extension of 80 roof rafters; toilets installed in infirmary and new water-supply pipes laid; new electric lights placed and water meters set.....	319. 48

26 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

<i>Convalescencia</i> .—Pavilion painted; 600 feet cast iron, galvanized, pipe laid in garden, and 100 feet of hose purchased and placed in use	\$266. 60
<i>Maintenance of harbor property</i> .—Repair of machine shops, general repairs to buildings, and assorting and storing materials and supplies on hand.	256. 97

EXTRAORDINARY EXPENDITURES, DIVIDED UNDER THE FOLLOWING BUILDINGS.

<i>Red house</i> .—Construction and repair of outhouses, slight repairs to doors, windows, and shutters, and general repairs to roof; installation of toilet and slight repairs to plumbing; call-bell system placed in operation.	219. 71
<i>Pabellon de San Jose</i> .—All rooms whitewashed and renovated in general, painting and repair of doors, shutters, and blinds, with general repair to roof. Installation of toilet and repairs to plumbing. Electric-light wires repaired and extended, new lights placed, water meters installed. . .	174. 15
<i>Fortaleza No. 2</i> .—New system of cast-iron pipe drains for entire surface water drainage system. General repairs to roof and slight repairs to plumbing fixtures. Painting where necessary, and repairs to doors and shutters. Water meters installed	165. 31
<i>Public works stables</i> .—Purchase of team, hire of driver, feed of team and care of team and vehicles	557. 26

All the above buildings are furnished with electric light under contracts made for the whole year with the two existing companies in San Juan—the Luz Electrica Company and the San Juan Light and Transit Company. Water is also furnished under an agreement made with the city, which owns the waterworks. The rates are, however, so excessive that should they continue it would be good policy for the insular government to have its own water supply constructed. A reduction in the rates, if not an entire abolishment, should certainly be demanded in the case of those buildings, as the insane asylum, beneficencia, and the penitentiary, now entirely maintained by the insular government, in which the inmates largely come from this city.

(3) FRANCHISES.

In accordance with the Spanish laws of public works, which are still in force, and in compliance with the regulations and requirements of the ordinances passed by the executive council, this bureau exercises, through the commissioner of the interior, a certain supervision over all works of a public nature to be constructed under franchises or concessions granted to private corporations and by municipalities. This supervision embraces the examination and approval of plans and projects submitted and the inspection of the works while under construction.

The number and status of franchise work brought to the notice of this office were at the end of the fiscal year as follows:

1. Franchise granting Ramon Valdes the use of the waters of the La Plata River between Bayamon and Comerio, to develop water power for mechanical purposes to be applied to the generation of electric energy, and granting permission to erect and maintain lines of wire for the purpose of lighting, motive power, and heating, dated December 17, 1900. No plans have yet been submitted for approval.

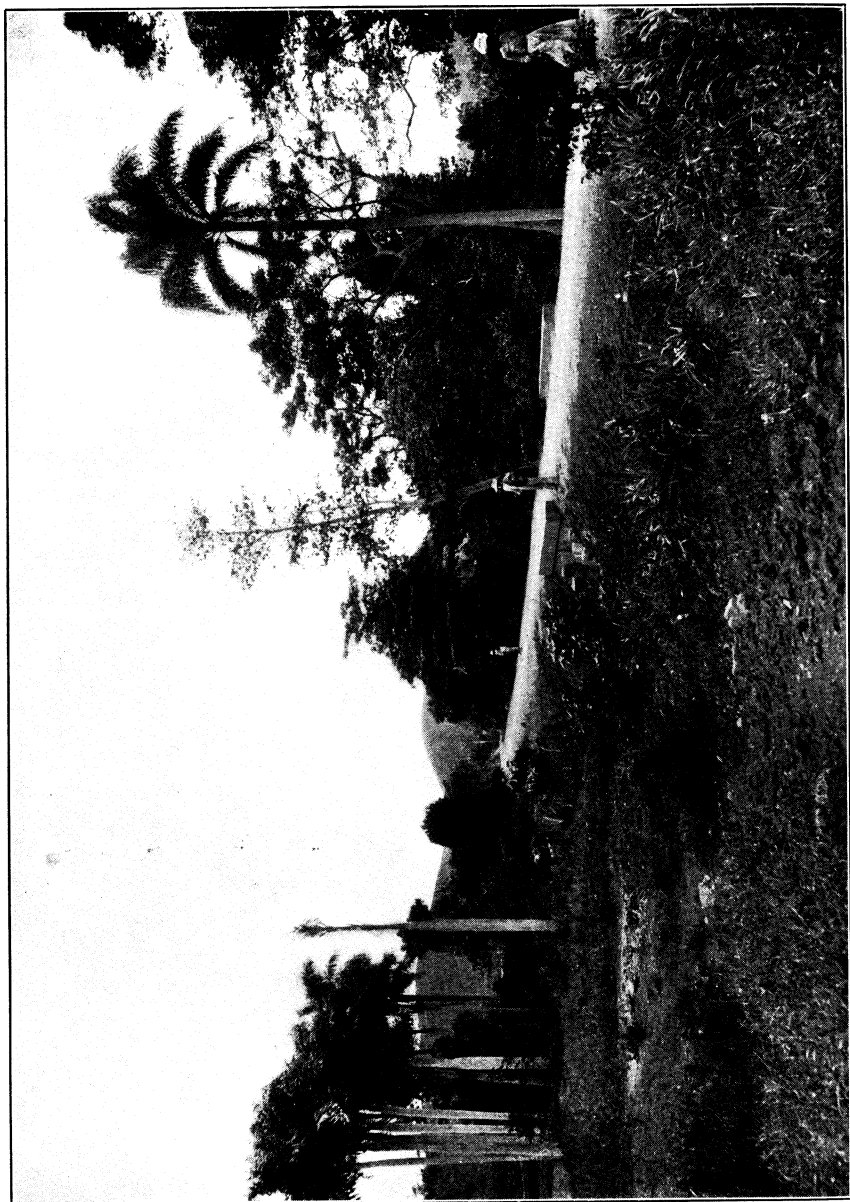
2. Franchise granting W. S. H. Lothrop the right to establish and run an electric street railway in the city of Ponce and between Ponce and Ponce Playa, dated February 27, 1901. Plans were submitted and approved. Work begun May 27, 1901, and the line to the Playa was opened to the public in May, 1902; that through the city is still under construction.

3. Franchise granted the Guanica Land Company to use certain waters for the purpose of irrigation; to construct a wharf in Guanica Bay, and to construct and operate a private railway along certain portions of the harbor of Guanica, dated March 19, 1901. Plans for the wharf were submitted and approved and the wharf has been constructed. No other plans have been submitted.

4. Franchise granted the "Port American Company" for building and operating railroads in the island of Porto Rico, dated July 12, 1901. A general plan showing the proposed lines has been submitted; no final action can be taken, however, until the detail plans have been examined.

5. Franchise granted to Pedro Juan Rosaly, for the purpose of erecting, maintaining, and operating a system of local and long distance telephone lines in the island of Porto Rico, dated July 22, 1901. No plans have yet been submitted.

6. Franchise granted De Ford & Co., as proprietors of the Central Aguirre Railroad, to occupy, temporarily, a portion of the public highways between Salinas and Santa Isabel, for a length not to exceed 3,000 meters, to lay thereon a cane railway track. No plans were submitted.



CAGUAS-HUMACAO ROAD. FINISHED ROAD BETWEEN CAGUAS AND GURABO.

7. Franchise granting Messrs. Charles and William McCormick the right to use the waters of the river Baldrich for the irrigating of land in the municipality of Arroyo, dated March 4, 1902. No plans or maps have yet been submitted.

8. Franchise granting the "Compañía de los Ferrocarriles de Puerto Rico" the right to construct a spur or branch track not to exceed 80 meters in length upon the Ponce main road, dated May 15, 1902. This track was laid and inspected under supervision from this bureau.

9. Franchise granting the same company the right to construct a branch track from the present station into the town of Arecibo and to cross and use certain portions of the public highway known as "Camino de la estacion," dated June 3, 1902. No plans have yet been submitted.

10. Franchise granted the successors of the "Compañía de los Ferrocarriles de Puerto Rico" to take and receive for hire telegraph or telephone messages between certain points along its right of way, dated June 25, 1902.

I would respectfully call your attention to the fact that the expenses connected with the examination of plans and projects submitted under these franchises, and the subsequent periodical and final inspection of the works constructed under them, are now being paid by this bureau. The engineers or inspectors delegated for this work, who are on the regular budget list, have to leave their routine work and are sent out, sometimes at great expense, to make the necessary examinations and inspections, and their traveling expenses are paid from appropriations which properly have no relation with that class of work. As this branch of the service appears to become more extensive it will be necessary hereafter to make provision for it in the regular budget. A better solution, however, would seem to be to compel hereafter by law those obtaining a franchise of any kind to refund all expenses of supervision and inspection incurred on their account by this bureau, until the works or privileges granted thereunder have received a final approval and have been so reported. These expenses should be readily borne by the grantees who seek and obtain these unquestionably valuable concessions, and it is with that object in view that I have advanced this suggestion.

Very respectfully,

A. STIERLE,
Superintendent of Public Works.

HON. WILLIAM H. ELLIOTT,
Commissioner of the Interior for Porto Rico.

APPENDIX A.—Synopsis of disbursements made by bureau of public works on account "regular budget" during fiscal year ending June 30, 1902.

Designation.	Appropriations.	Disbursements to June 30, 1902.	Balance on hand June 30, 1902.
Salaries:			
Office force	\$26,780.00	\$25,826.00	\$954.00
Field force	127,661.45	117,178.00	10,483.45
Contingent expenses	3,654.55	3,629.13	25.42
Maintenance and repair of roads	a 165,855.00	156,817.27	b 9,037.73
Maintenance and repair of public buildings.....	34,996.00	{ c 7,571.29	{ d 4,971.32
Expenses executive mansion	12,859.42	{ 22,453.39	{ 405.30
		12,454.12	
Total	371,806.42	345,929.20	25,877.22

a Includes \$10,855, transferred by auditor from "trust fund" to removal of landslides.

b Contract in force covering \$8,172.92.

c This amount, \$7,571.29, disbursed by auditor of Porto Rico.

d Contract in force covering \$1,800.

Synopsis of disbursements from "deficiency appropriation" act of March 1, 1902 (no fiscal year), from March 1 to June 30, 1902).

Designation.	Appropriations.	Disbursements.	Balance on hand June 30, 1902.
Permanent repairs, executive mansion	\$7,000.00	\$1,308.57	\$5,691.43
Building cells in insane asylum.....	1,500.00	1,432.15	67.85
Total	8,500.00	2,740.72	5,759.28

28 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

APPENDIX B.—*Synopsis of disbursements made by the bureau of public works on account of "trust fund" up to June 30, 1902.*

Designation.	Allotments.	Disbursements to June 30, 1902.	Available balance July 1, 1902.
Arecibo-Ponce road, Arecibo section.....	\$42,726.00	\$41,546.70	\$1,179.30
Arecibo-Ponce road, Defendini, kilometer 15.....	90,000.00	45,193.76	44,806.24
Arecibo-Ponce road, Adjuntas-Utuado, Rio-Chico section.....	74,000.00	20,426.47	53,573.53
Manati-Ciales road, second section.....	49,688.00	30,885.46	18,812.54
Caguas-Humacao road.....	65,000.00	60,409.16	4,590.84
San German-Pezuela bridge road.....	10,000.00	9,997.39	1.61
Mavilla River bridge.....	12,000.00	9,734.56	2,265.44
San Sebastian-Lares road.....	75,000.00	1,220.19	73,779.81
Fajardo Naguabo-Playa road.....	10,000.00	8,240.74	1,760.26
Removal of land slides.....	a 10,855.00	.....	.....
Yabucoa-Maunabo road.....	38,000.00	2,398.76	35,601.24
Cidra-Las Cruces road.....	3,427.72	3,424.46	3.26
San Lorenzo-Caguas road.....	2,500.00	2,485.55	14.45
San Rafael culvert.....	1,800.00	1,800.00	.....
Aguas Buenas-Caguas road.....	1,000.00	999.40	.60
Surveys.....	.....	41,255.30	.....
Total.....	486,006.72	280,017.90	236,389.12

a Transferred by auditor to regular budget and expended thereunder.

EXHIBIT B.

REPORT OF THE SUPERIOR BOARD OF HEALTH.

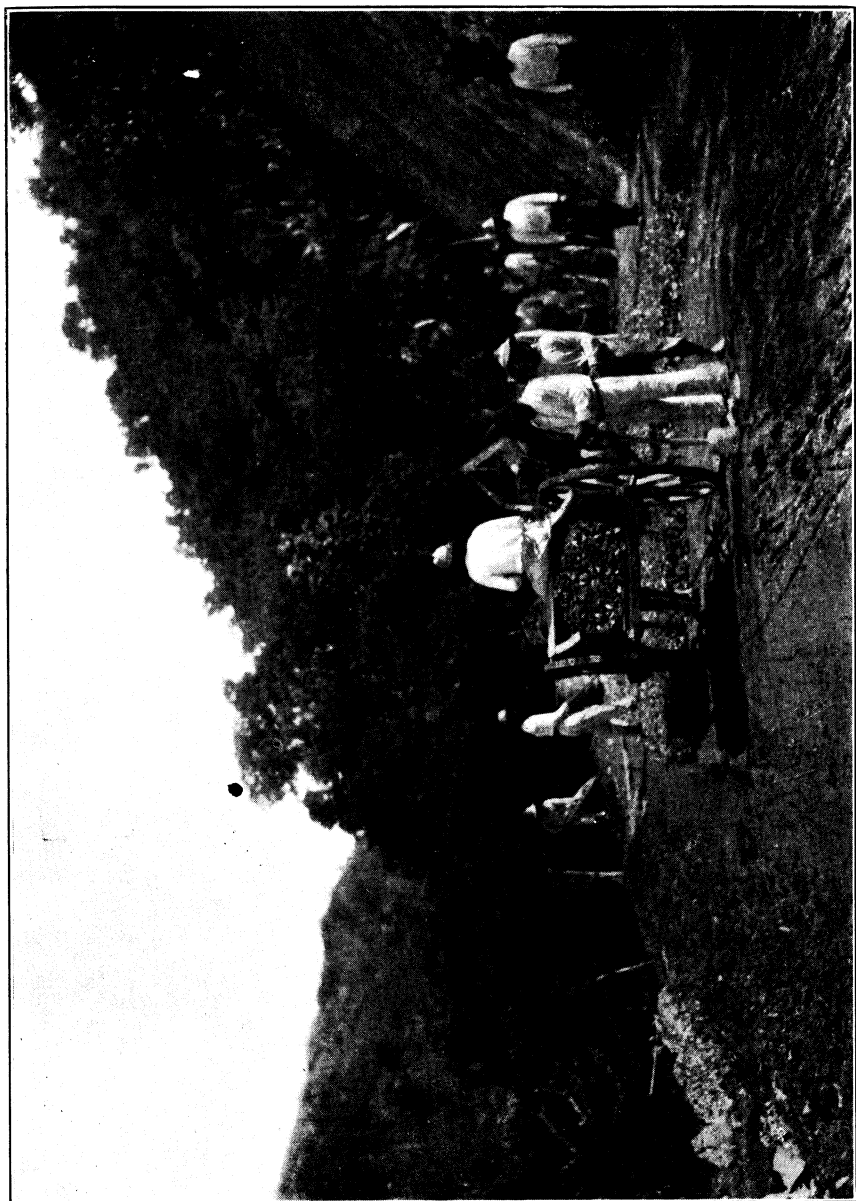
DEPARTMENT OF THE INTERIOR OF PORTO RICO,
SUPERIOR BOARD OF HEALTH,
San Juan, June 30, 1902.

SIR: I have the honor to submit the following report on the work of the superior board of health from July 1, 1901, to date:

It is a source of great pleasure to be able to prove that in sanitary matters there has been a decided improvement during the past year in almost every part of the island, and that in some districts the advance has been very marked. Public opinion is being slowly but surely awakened to the importance of sanitation and to the necessity for making better arrangements for the care of the sick poor than have previously existed. By far the most difficult problem which the board has to solve is that of the medical attendance on the sick poor, for in addition to the time-honored habits of official inaction, there is the serious difficulty arising from the poverty of the majority of the municipalities. Such pittance as are offered for medical services by the various ayuntamientos can not possibly secure either good men or honest work, and it is nothing less than a public scandal to ask members of an honorable profession to perform arduous and often dangerous work for the wages of a dock laborer.

It is a safe statement to make that at least three-fourths of the sick poor in Porto Rico are never seen in life by a physician, and in several districts the figures would probably be nine-tenths. Quackery of any and all sorts is the necessary consequence of this state of affairs, and the strict enforcement of the law against irregular practice works a certain amount of hardship by depriving the poor of help of any kind. It is the intention of the board to impress upon the next legislature the urgent need of reform in the present system of medical relief, and of the establishment of a system more in accordance with the principles of civilization and humanity. In the new system the question of hospital accommodation must be a prominent feature. At present the accommodation is miserably insufficient in all districts, and is entirely absent in many. But in nearly all the towns where hospitals exist some effort has been made to improve conditions, and several towns have in various stages of progress plans for the erection of hospital buildings. The old and altogether unfit Santa Rosa Hospital of San Juan has been dismantled, and the city is now preparing for occupation a building in Puerta de Tierra which is capable of being made a very fair hospital, but which of necessity lacks many features deemed essential according to modern ideas.

The capital sadly needs an isolation hospital for contagious diseases, and the board last year had to assist with its funds the local authorities in rigging up a temporary



UTUADO-ADJUNTAS ROAD. PLACING MACADAM.

arrangement to deal with smallpox cases. This year the sole accommodation for such cases consists of three old and dilapidated tents, the arrangements for the supply of food, clothing, and bedding being of the most primitive and unsatisfactory kind. However, it is believed that in the near future the present conditions will cease to exist, and the city will be prepared, as it ought to be, for emergencies which are likely at any time to arise, and which must be promptly met. In Yauco the hospital is well equipped, well managed by Sisters, and is a credit to the town. For some considerable time the foundations for a new hospital have been laid, and it is the intention of the ayuntamiento to erect on these a first-class hospital of modern type. The cost of this will be defrayed from the loan recently negotiated by the city. The proposed hospital in Guayama is still in the paper stage, but it is thought probable that it will be completed the ensuing year. The plans for it are well drawn and have been approved by the board. In Mayaguez and Arecibo the hospitals are in good order, and in both certain improvements are contemplated. The condition of the Tricoche Hospital in Ponce still leaves much to be desired, but the plea of absolute poverty of the city is put forward as a bar to any improvement. The sanitary conditions here are phenomenally bad, but the patients are on the whole reasonably well cared for. The consolidation of several municipalities will probably cause considerable changes in local administration, but as yet the board has received no information on the subject of hospitals or medical relief under the new system of administration.

The work of the board now embraces a very wide field, and in the departments recently taken up substantial progress has been made. Plumbing and house drainage have received much attention and the board has now secured the services of an expert American plumber as inspector. Regulations have been published based on the laws existing in the most advanced States of the Union, and a system of examination and license for all persons in business as master plumbers or as journeymen has been inaugurated. Some opposition was experienced at first from certain trades-union agitators, but this soon disappeared, and to-day the trade is unanimous in support of the board in its actions. It is gratifying to note that several native plumbers are taking kindly to the new order of things, and are learning with rapidity the novel modern system of work.

In the matter of house drainage great strides have been made. The old-fashioned brick and cement drains are being replaced by heavy iron tubing, and there is now a consensus of opinion on the part of property owners as to the superiority of the new method. As much of the city is still unsewered, it is impossible to carry out in full the intention of the board, but work will shortly be commenced on the new sewerage system, and when this is completed San Juan will be a model city in this respect. Every house will be connected with the main sewer, cesspools will be entirely done away with, and flush closets will be found in every residence. Aqueduct water is being laid on as rapidly as possible, and in a short time the old-time cistern will cease to be a source of danger, as it now is.

In Mayaguez a thorough drainage system will shortly be carried out. The city has been fortunate in securing the services of Mr. Domenech as engineer, and he has succeeded in elaborating plans by which the many difficulties can be overcome. The situation of the city is peculiar and presents many serious problems for solution, but I believe that all have been successfully met and that the result will reflect credit equally on the city and its able engineer.

The question of drainage for Ponce has not yet assumed a tangible form. The difficulties hereto met are unusually great, and the ultimate solution of same will call for a large expenditure of money and a high degree of engineering skill.

Except for one small drain, which serves for the military hospital and the *alcaldía*, Ponce has no sewers, and the district being very large, the cost of sewerage must be enormous, whatever system be adopted. Much of the city lies very low, and portions of the *playa* or port are below high-water mark. This fact seriously complicates the problem, as a pumping station would be a necessary feature in this system. In view of the splendid results obtained from sewage farms in various parts of the world, I can not but think that similar results might be had in Ponce, for there is an extensive territory devoted to sugar, and this is more than sufficient to absorb and utilize the sewage from a larger population than will ever exist in Ponce. If this plan is found feasible, it could be carried out at a minimum of cost, and the money value of what is now worse than wasted would be very great.

Plans are also under consideration for the drainage of Arecibo, Yauco, and other towns, but it is impossible to say when the money can be available for this purpose. A loan has been obtained for Arecibo, but this will be expended chiefly on water-works and electric-light plant. Yauco has also floated a loan, and this will be used to establish a water supply, to build a new market, and to complete the erection of the hospital.

In the smaller towns of the interior it will be hopeless to think of any system of drainage except of a rudimentary sort. All that can be done at present is to enforce the proper care of such arrangements as are practicable, and to see that all garbage and excreta are removed to a safe distance. Cremation is, of course, the best of all methods for disposal of garbage, but it can not be economically carried out except on a large scale. It was hoped that a crematory would shortly be established in San Juan, plans for one having been submitted and approved, but I understand that the matter has been indefinitely postponed by the ayuntamiento. This is much to be regretted, for the present system of garbage disposal is most unsatisfactory and is a source of great complaint.

VETERINARY SANITATION.

For several months the work in this branch has been very heavy, and has been most ably performed under the supervision of Dr. Schirmer. Glanders was very prevalent, and little or no attention was paid to the matter by local authorities. A system of rigid inspection was instituted, all suspected animals were isolated, tested with mallein, and at once destroyed if the diagnosis of glanders was confirmed. A quarantine station for animals has been established near the city of San Juan, the ground being given by the ayuntamiento, and several animals have been destroyed there. By a strict inspection and separation of all infected animals, this terrible disease can soon be eradicated from the island, but we have one very serious difficulty to contend with, and that is the persistence with which certain ignorant persons claim to cure glanders.

The belief in the curability of glanders is common among the country people, and this being the case, they look on the radical measures of the board with mistrust, and try every means to conceal cases of disease. Time and education are necessary to overcome this obstacle, but in the meantime the board must continue in the exercise of its utmost powers to put an end to an alarming state of affairs. That success is rewarding our efforts is shown by the fact that for months past there has been no case of death by glanders in the human subject, whereas during the twelve months previous to June, 15 persons had lost their lives from this cause. It has not been possible with the limited means at our disposal to make a thorough investigation of other diseases of animals, but it is believed that anthrax prevails to a certain extent in some districts. This subject will be taken up in the coming year. No cases of rabies in man have been reported during the year, and but few cases in dogs.

LEPROSY.

Nine cases of leprosy have been sent to the colony on Cabras Island during the year, 2 have been discharged from there as nonlepers, and 2 have died. The present number in the colony is 23, of whom 14 are males and 9 females. The board is very anxious to collect all the lepers on the island, but the practical difficulty as to transportation is very great. Railroads and steamships will not take them at any price and in many cases the local authorities have pleaded absolute inability to pay the expense of having private transportation, thus nullifying the provisions of the charities act which impose on the ayuntamientos the duty of transferring lepers to the colony.

SMALLPOX.

From July to December, 1901, the island was practically free from smallpox, but in January, 1902, cases of varioloid began to be reported in many districts. The number of cases slowly but steadily increased, the chief centers of disease being Ponce, San Juan, Arecibo, Camuy, and Utuado. The disease was of a singularly mild type, only cases of confluent smallpox being reported, and no death occurred from disease contracted in the island. One death occurred in Arecibo, the patient having come from New Orleans and being, through an error, landed in a very critical state.

Upon the first appearance of the disease steps were taken to isolate all as far as possible, but the facilities for this were very limited in every place, and entirely absent in some. Application was made to the governor for funds to meet the emergency, and, as has always been the case, the appeal was at once responded to. One thousand dollars was placed in the hands of the board, and with this sum a hospital was built in Camuy, bedding and furniture purchased through the Woman's Aid Society, and the concern was in running order in a very short time. Arrangements were also made for extra medical assistance in Arecibo, and vaccination was pushed with all possible energy. It is only fair to make special acknowledgment

of the splendid work performed in Arecibo by Dr. L. Gastambide, who labored night and day with the true spirit of a conscientious public servant and to whom the board was unable to offer more than a nominal compensation. Few persons are aware of the immense difficulties attending a work such as is vaccination in Porto Rico. The people are, as a rule, indifferent, they live in a country where travel is often dangerous, if not impossible, and where evasion of official visits is particularly easy. In spite of all this the work has been pretty thoroughly done, and the board feels confident that the good results from it will be plainly seen in the future.

Similar work was undertaken in the other towns affected, and special attention was given to the schools. In these there was found a large number of children who had been either not vaccinated at all or else very imperfectly protected, and considerable laxity was shown to have existed in the granting of certificates of vaccination without the necessary inspection to prove the result of the operation. Such carelessness is of course almost criminal, but is partly excusable from the fact that the medical officers are overworked and ridiculously underpaid. No more important work can be done than that of vaccination, but unless the authorities, insular or local, provide the necessary funds, it can never be carried out as it ought to be, and the island will be annually exposed to great danger and expense. The public alarm is always apt to be exaggerated, and this year it assumed large proportions. A strict quarantine was established by the neighboring islands against Porto Rico and serious injury to trade and travel was the consequence. As a matter of fact, there was no sufficient reason for such measures, but it seemed as if the foreign authorities were influenced more by popular clamor than by the facts of the case, and the protests of the board were in every case disregarded. As no quarantine was enforced against New York, Boston, and other United States cities where true smallpox existed to a considerable extent, the injustice to Porto Rico was conspicuous. In a period of two and a half months ending March 7, 1902, the deaths from smallpox in the United States were 615, and yet trade was absolutely free from restriction, whereas in Porto Rico there was scarcely any true smallpox and no death therefrom.

In February, 1902, a number of cases of a disease locally known as "buba" were reported from Isabela. This is a disease characterized by severe ulcerations of the skin with great debility. A special investigation was at once made by Dr. Saldaña, and in accordance with his recommendations a temporary isolation hospital was constructed there and the needed medicines furnished. The funds for the purpose were supplied from a special appropriation of \$250 promptly granted by the governor. Very quickly the disease was controlled and has since given no trouble.

Diphtheria has occurred in several towns on the island, but in no place has it assumed an epidemic form, and the type of disease has rarely been malignant. Treatment by antitoxin has been adopted in a few cases and with success, but the question of the value of this treatment being still a matter of dispute the board has not felt justified in incurring the heavy expense incident to a distribution of serum. The need of a bacteriological laboratory by the board is greatly felt in connection with this disease, for only by culture experiments is it possible to diagnose with certainty or to fix definitely the period at which the patient can be safely released from quarantine.

As in all other places, tuberculosis is the great and fatal scourge of Porto Rico, and under the peculiar conditions here the difficulties in the way of checking its ravages are very great. Sleeping in crowded rooms which are invariably sealed up at night against any possible entrance of air, the people expose themselves to every possible risk of contagion. The personal habits of the poorer classes are in favor of contagion through the dissemination of sputum, and attempts to change these habits are almost invariably a failure. However, the board is about to publish simple hints for general distribution on the subject, and some benefit is confidently expected from this course. I am happy to say that the practice of spitting in public places has been practically abolished, owing to the measures taken by the board, and that our public buildings, stores, and trolley cars no longer offend decency.

EXAMINATIONS FOR LICENSES.

At the examination held in January there appeared 2 candidates for license as physicians. Of these 2 passed.

For license in pharmacy 5 presented themselves, of whom 4 passed.

For license as practicante 2 candidates appeared, 2 being successful.

At the examination held in June the result was as follows: For physicians 1 candidate, 1 passed; for pharmacists 4 candidates, 4 passed.

In January, 1902, an examination in plumbing was held. For this there appeared 20 candidates for license as master plumbers, of whom 7 passed.

— applied as journeymen, of whom 20 were passed. The standard of examination was kept low for obvious reasons, but on each succeeding examination it will be raised until it approximates that of the United States. The examination was oral, written, and practical, the latter being conducted in a temporary workshop rigged up on the premises of the board. Considerable intelligence was shown by some of the candidates, but the practical work was very naturally of poor quality, leadwork being an entirely new branch for them. Our inspector has always been ready to give every possible assistance, theoretical and practical, to those who apply for it, and his work is highly appreciated. Since his appointment in November, 1901, there has been a real boom in the sanitary business, and 185 houses in San Juan have been put in thorough repair and fitted with modern plumbing.

The condition of the patios and excessive overcrowding of the houses occupied by the poorer classes are matters with which the board has been unable to deal in a satisfactory way. Until accommodation is provided in the shape of more houses, overcrowding is inevitable, and until the city provides a public laundry the present abominable state of the patios must continue. Laundry work is almost the only industry of the poor, and for this the patio is the only available place. I see no good reason why a well-equipped public washhouse should not be provided by the city, or why such an establishment should not be at least self-supporting, if not a source of revenue, as is the case in hundreds of other cities.

The work of the medical inspectors of the board has been extremely arduous and has been performed in a most able manner. The results have been very marked in many towns, and in some it has been impossible to stir up the authorities to a sense of their duty by any means within the power of the board. Absolute poverty is put forward as the reason for inaction, but this is only an excuse in part, and can not justify the filthy conditions existing in many places.

Special attention has been given to slaughterhouses, bakeries, and other places in which food is prepared or sold, and the most drastic measures have been employed to enforce the orders of the inspectors. Scores of places have been closed until put in decent condition, and many tons of bad food have been destroyed. In one store upward of 15 tons of codfish were condemned and destroyed, and all over the island the quality of this article was found very inferior. Much of this fish being imported from British ports, a letter was sent to the British consul requesting him to notify the exporters that fish of inferior quality would be at once seized here and destroyed. Large quantities of hams were also destroyed as unfit for food, and this action led to some difficulty with one of the great packing houses in the United States. After a full investigation by the board, the action of the inspector was sustained, and the matter was finally settled by the withdrawal from the market of the particular brand which was found unsatisfactory.

Several instances of drug stores carried on in violation of law were found by the inspectors, and prompt measures were taken to enforce the laws.

The sale of drugs and medicines by general merchants has long been a cause of complaint by pharmacists. They are rigidly confined to the sale of medicines and allied articles, and were justified in claiming relief from a genuine hardship. After full discussion of the question on all sides, the board issued a circular forbidding after July 1, 1902, the trade in medicines by unqualified merchants. A few articles in common use, such as borax, olive oil, camphor, and the like were specified as legitimate objects of general trade, and the circular has been cheerfully accepted by all concerned.

Considerable progress has been made in the matter of cemeteries, but the scarcity of municipal funds has delayed the construction of many new ones which are badly needed. The apathy displayed in this matter is remarkable, and it seems almost impossible to arouse the public mind to the importance of providing safe and decent methods of interment. The board is most anxious to establish relief cemeteries in outlying barrios in large districts, but has been met with the practical objection that it is impossible to have the civil registry properly kept up by the municipal judge. This difficulty can, I think, be readily removed by executive or legislative authority, and a great benefit thus be conferred on the poor who are now compelled to carry their dead long distances to a central cemetery.

The water supply of the island is by no means as good as it ought to be, considering the ample sources available, but there is considerable activity being shown by some towns to improve existing conditions. Of course the cost of waterworks is very heavy, but I see no reason why any city whose credit is good can not by a special issue of water bonds become the owner of a good system and gain a fair revenue therefrom. A large portion of the loan recently obtained by San Juan is assigned to the extension and improvement of the works there, and the benefits to the city will be well worth the cost. The present intake is badly located, and the removal of this to a point farther upstream must be made if a good and clear supply is to be had.

The chemist of the board has made repeated analyses of the water, and reports it as being generally of fair quality, but by no means first class.

In Ponce the waterworks are of the most primitive kind, but the quality of the water is good, and the chief complaint made is of the muddiness. Yauco will soon have an admirable supply in quantity and quality. Arecibo is following the example, and other towns are merely waiting for loans in order to commence operations. But in order to obtain the best results the pollution of streams must be stopped, and this interference with ancient custom will be strongly opposed. Pollution of streams is well nigh universal, and even in the cases where the stream is not used for drinking serious nuisances arise from the discharge of refuse from distilleries, tanneries, and other factories. The refuse liquor from rum distilleries is horribly offensive, and is fatal to all fish; and in Ponce a serious loss has in this way been caused to the local fishermen. The board has been successful in several cases in persuading or compelling manufacturers to refrain from their former practice, and in time it is believed that every serious cause of complaint will disappear.

I desire to call attention to the report of Dr. Berkeley hereto annexed. (Appendix B.) His work has been most arduous and exacting, and has been carried on under difficulties which would long ago have discouraged a man of less enthusiasm and devotion to duty. The need of proper facilities for this work is urgent, the present premises used as a laboratory being utterly unfit for the purpose and absolutely forbidding the prosecution of certain classes of work. The rooms now occupied are in the custom-house, and as the Treasury claims this as its property the board of public works is not permitted to do anything in it. Meantime the Treasury Department refuses to make any improvement, although the chemist is often called upon to make investigations in cases pertaining to the customs department.

The subject of prostitution is one which the board has been unable to deal with, although much attention has been given to it. The objections to any system of inspection and registration of women are very great, and the attempt to carry out the plan in San Juan proved an entire failure. It is comparatively easy to control the avowedly professional class of women, but it is utterly impossible to regulate or prevent the traffic carried on by those who may be termed amateurs. All that seems practicable is the strict enforcement of police regulations to such a degree as to prevent public scandal, and to this end the restriction of residence to certain allotted districts in towns seems advisable. Laws and regulations of the most elaborate kind have failed in Habana and other cities to do more than to lessen the public display of the nuisance, and there is no reason to expect greater results in Porto Rico, even with a greater expenditure than is here possible.

Vital statistics is of course the true test by which the work of a board of health is estimated, and I am happy to say that the figures given in the annexed tables are of the most satisfactory sort and are full of encouragement for the future. For the benefit of those unwilling to study the matter in detail I append a brief résumé of the principal diseases of Porto Rico and their comparative mortality in this year and the preceding one. It will be seen that the total deaths in this year are 1,800 less than during last year, and there is every reason to believe that this splendid showing is chiefly due to the great sanitary reforms which have been carried out. Sanitary education is a plant of slow growth, even when nourished with golden showers, but the growth in Porto Rico is steady if slow, and will doubtless progress at a faster rate in future.

I regret to say that owing to insufficient funds and the consequently limited office staff it has been impossible to reciprocate the courtesies extended to us by the various States of the Union and foreign countries that have sent us their valuable reports, requesting the usual exchange of documents. This anomalous state of affairs will no longer exist, as the staff will be increased during the coming year, when Porto Rico will take her rightful place as the source of information of the most valuable kind. The vast mass of records of vaccination under the military government is in process of tabulation and the results of the largest work on record will soon be published. The value of such a report can not be exaggerated, and in this and other matters the board feels justified in expecting the liberal assistance of the legislature. The work of the board must be a constantly increasing one, and on its real results largely depend the health and lives of the community and consequently the productive capacity of the island.

A courteous invitation was sent by the American Public Health Association that the board be represented at the congress held at Buffalo in September, 1901, and the secretary was thereupon deputed as delegate of the board. He received also from the governor a special recognition as representative of the island in general, and was directed to investigate the methods in use in the health boards of Boston, Albany, New York, Buffalo, and Washington, with the view of introducing any useful features

34 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

of their work in the office here. His reception at Buffalo and elsewhere was most cordial and flattering, every possible courtesy being extended to him, and great interest being shown in Porto Rico by all those he met. He read, by request, a paper before the congress, which was well received as an evidence of the progress of Porto Rico in sanitation, and was appointed on the executive committee as member for Porto Rico. Much valuable information was secured during his trip, and the benefits accruing to the office have been very great.

The board trusts that Porto Rico may in future be represented at all the meetings of this great association and that she will be found standing in the front rank of exponents of modern sanitation. Great are the powers of the board and very deeply does it feel the responsibilities laid upon it. Under the new organization which goes into effect on July 1, the board will be materially strengthened in its personnel, and even better results may be expected than those which I have the honor now to submit.

Accompanying this report are appended special reports from Dr. Berkeley, chemist to the board; Dr. Schirmer, veterinary inspector, and Mr. Spaven, inspector of plumbing. All of these are well worthy of serious consideration.

Very respectfully,

R. M. HERNANDEZ, M. D.,
President Superior Board of Health, Porto Rico.

Hon. WILLIAM H. ELLIOTT,
Commissioner of the Interior for Porto Rico.

Receipts and disbursements of the superior board of health of Porto Rico, fiscal year 1901-2.

CR.

1901.			
July	9. T. D. 1595, A. W. 730.....	\$207. 92	
	24. T. D. 1700, A. W. 759.....	1, 170. 02	
			\$1, 377. 94

DR.

31. Salaries, S. B. H	\$651. 82		
Salaries, vaccination station	106. 20		
Supplies, S. B. H.....	161. 62		
Supplies, vaccination station	26. 71		
Traveling expenses.....	118. 10		
		1, 064. 45	
Balance		313. 49	
			1, 377. 94

CR.

Aug.	1. Balance	313. 49	
	14. T. D. 1829, A. W. 778.....	1, 556. 18	
			1, 869. 67

DR.

30. Salaries, S. B. H	950. 30		
Salaries, vaccination station	106. 20		
Supplies, S. B. H.....	170. 30		
Supplies, vaccination station	23. 91		
Traveling expenses.....	44. 00		
		1, 294. 71	
Balance		574. 96	
			1, 869. 67

CR.

Sept.	1. Balance	574. 96	
Aug.	30. T. D. 1988, A. W. 813.....	1, 184. 00	
	Disallowance, voucher 10	1. 51	
			1, 760. 47

DR.

Sept. 30. Salaries, S. B. H	797. 20		
Salaries, vaccination station.....	103. 60		
Supplies, S. B. H	301. 86		
Supplies, vaccination station	43. 93		
Traveling expenses.....	106. 83		
		1, 353. 42	
Balance		407. 05	
			1, 760. 47

		Cr.	
Oct.	1. Balance	\$407. 05	
	15. T. D. 2257, A. W. 868	1, 173. 30	
		<hr/>	\$1, 580. 35
		Dr.	
	31. Salaries, S. B. H	\$823. 90	
	Salaries, vaccination station	106. 20	
	Supplies, S. B. H	138. 35	
	Supplies, vaccination station	36. 91	
	Traveling expenses	383. 48	
		<hr/>	1, 488. 84
	31. Balance	91. 51	
		<hr/>	1, 580. 35
		Cr.	
Nov.	1. Balance	91. 51	
	15. T. D. 2518, A. W. 907	1, 398. 80	
	27. T. D. 2581, A. W. 932	37. 50	
		<hr/>	1, 527. 81
		Dr.	
	30. Salaries, S. B. H	834. 70	
	Do	103. 60	
	Do	139. 41	
	Do	25. 55	
	Do	61. 39	
	Do	54. 00	
		<hr/>	1, 218. 65
	30. Balance	309. 16	
		<hr/>	1, 527. 81
		Cr.	
Dec.	1. Balance	309. 16	
	17. T. D. 2736, A. W. 969	1, 243. 10	
		<hr/>	1, 552. 26
		Dr.	
	31. Salaries, S. B. H	973. 90	
	Salaries, vaccination station	106. 20	
	Supplies, S. B. H	102. 71	
	Supplies, vaccination station	31. 45	
	Traveling expenses	81. 36	
	Suppression animal diseases	73. 00	
		<hr/>	1, 368. 62
	31. Balance	183. 64	
		<hr/>	1, 552. 26
		Cr.	
1902.			
Jan.	1. Balance	183. 64	
	10. T. D. 2875, A. W. 996	1, 380. 20	
		<hr/>	1, 563. 84
		Dr.	
	31. Salaries, S. B. H	992. 10	
	Salaries, vaccination station	108. 10	
	Supplies, S. B. H	179. 28	
	Supplies, vaccination station	25. 71	
	Traveling expenses	51. 37	
	Suppression animal diseases	55. 00	
		<hr/>	1, 411. 56
	31. Balance	152. 28	
		<hr/>	1, 563. 84

36 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

		CR.		
Feb.	1. Balance		\$152. 28	
	10. T. D. 3088, A. W. 1028		1, 395. 60	
				\$1, 547. 88
		DR.		
	28. Salaries, S. B. H	\$1, 060. 80		
	Salaries, vaccination station	99. 80		
	Supplies, S. B. H	121. 63		
	Traveling expenses	43. 44		
	Suppression animal diseases	55. 00		
			1, 380. 67	
	28. Balance		167. 21	
				1, 547. 88
		CR.		
Mar.	1. Balance		167. 21	
	11. T. D. 3264, A. W. 1070		1, 475. 20	
	28. T. D. 3480, A. W. 1112		500. 00	
				2, 142. 41
		DR.		
	31. Salaries, S. B. H	1, 067. 10		
	Salaries, vaccination station	108. 10		
	Supplies, S. B. H	600. 61		
	Supplies, vaccination station	57. 62		
	Traveling expenses	108. 02		
	Suppression animal diseases	30. 00		
			1, 971. 45	
	31. Balance		170. 96	
				2, 142. 41
		CR.		
Apr.	1. Balance		170. 96	
	4. Disallowance, voucher 10 .....		. 18	
	12. T. D. 3495, A. W. 1123		1, 300. 30	
	12. T. D. 3496, A. W. 1124		275. 00	
	18. T. D. 3520, A. W. 1143		200. 00	
	21. T. D. 3527, A. W. 1150		102. 20	
	23. T. D. 3578, A. W. 1155		200. 00	
				2, 248. 64
		DR.		
	30. Salaries, S. B. H	1, 180. 90		
	Salaries, vaccination station	104. 40		
	Supplies, S. B. H	104. 57		
	Supplies, vaccination station	39. 54		
	Traveling expenses	101. 32		
	Suppression animal diseases	10. 00		
	Smallpox	396. 76		
			1, 937. 49	
	30. Balance		311. 15	
				2, 248. 64
		CR.		
May	1. Balance		311. 80	
	10. T. D. 3738, A. W. 1177		1, 740. 70	
	20. T. D. 3865, A. W. 1199		115. 32	
	30. Credit on voucher		28. 49	
				2, 196. 31
		DR.		
	31. Salaries, S. B. H	1, 151. 35		
	Salaries, vaccination station	107. 20		
	Expenses, S. B. H	225. 53		
	Expenses, vaccination station	94. 19		
	Traveling expenses	104. 83		
	Suppression animal diseases	133. 61		
	Smallpox	200. 98		
	Refund to treasurer	9. 67		
			2, 027. 36	
	31. Balance		168. 95	
				2, 196. 31

CR.

June 1. Balance	\$168. 95
10. T. D. 3968, A. W. 1223	1, 048. 00
13. T. D. 3978, A. W. 1229	1, 172. 80
13. T. D. 3986, A. W. 1234	135. 00
13. Disallowed on voucher	67. 50
24. T. D. 4119, A. W. 1263	150. 00
24. Credit on voucher .....	. 65
	<hr/> \$2, 742. 90

DR.

30. Salaries, S. B. H	\$1, 203. 40
Salaries, vaccination station	104. 40
Expenses, S. B. H	418. 47
Expenses, vaccination station	101. 10
Traveling expenses	53. 40
Suppression animal diseases	74. 80
"Buba" relief	210. 89
Smallpox	389. 20
	<hr/> 2, 555. 66
30. Refund to treasurer of Porto Rico	187. 24
	<hr/> 2, 742. 90

Causes of mortality from June, 1901, to May 31, 1902.

Months.	Atresia.	Anemia.	Bronchitis.	Diphtheria.	Diarrhea.	Dysentery.	Enteritis.	Enterocolitis.	Malaria.	Meningitis.	Glanders.	Pneumonia.	Typhoid fever.	Raquitismo.	Tetany.	Tuberculosis.	Other causes.	Total deaths.
June	21	489	52	1	15	45	83	33	221	30	2	29	15	56	65	107	595	1, 859
July	25	526	40	2	13	28	82	36	227	21	0	34	14	62	68	103	656	1, 937
August	25	587	57	2	22	36	91	35	243	24	0	44	15	60	93	109	659	2, 102
September	24	511	47	2	18	32	79	33	238	25	0	42	3	49	88	120	507	1, 818
October	21	685	72	4	15	23	72	23	229	27	0	50	7	56	111	123	743	2, 261
November	14	598	98	1	7	22	79	34	256	32	1	94	6	61	108	122	759	2, 284
December	17	575	62	0	13	18	82	29	216	28	1	71	11	44	112	109	698	2, 086
January	25	567	86	2	10	22	74	35	198	20	8	64	4	67	125	135	709	2, 151
February	26	460	49	4	10	14	58	35	171	23	1	51	8	43	70	120	633	1, 776
March	31	534	61	2	11	21	73	27	199	27	0	56	12	57	107	128	763	2, 109
April	18	411	51	4	7	11	70	29	170	19	0	55	12	49	78	146	610	1, 740
May	14	319	61	2	14	23	87	33	128	30	0	36	7	43	90	104	332	1, 394
Total.	261	6, 333	728	26	155	295	930	382	2, 496	306	13	626	114	647	1, 115	1, 426	7, 664	23, 517

Causes of mortality from June, 1900, to May 31, 1901.

Months.	Atresia.	Anemia.	Bronchitis.	Diphtheria.	Diarrhea.	Dysentery.	Enteritis.	Enterocolitis.	Malaria.	Meningitis.	Glanders.	Pneumonia.	Typhoid fever.	Raquitismo.	Tetany.	Tuberculosis.	Other causes.	Total deaths.
June	101	894	142	4	321	62	353	105	184	35	5	91	28	108	72	154	1, 025	3, 682
July	89	1, 354	127	5	518	91	373	196	227	46	0	134	32	137	76	149	1, 456	5, 012
August	28	1, 485	116	4	427	108	257	167	237	41	0	156	20	140	94	153	1, 355	4, 788
September	69	1, 557	107	2	275	69	141	140	231	28	1	155	21	132	91	144	1, 016	4, 179
October	44	1, 550	112	1	177	61	205	100	196	20	1	123	29	170	103	131	957	3, 927
November	37	1, 284	92	1	119	16	129	117	196	30	1	86	25	95	107	117	969	3, 421
December	28	1, 076	93	1	111	28	96	52	305	32	1	38	26	73	84	126	735	2, 905
January	31	931	86	1	48	11	65	49	284	29	1	54	21	88	101	123	671	2, 594
February	14	688	67	3	34	12	74	41	175	27	0	29	17	63	75	104	427	1, 850
March	20	483	66	4	22	17	59	29	215	20	0	50	8	57	56	99	521	1, 726
April	15	276	38	0	18	14	62	35	203	12	0	42	8	48	70	120	584	1, 545
May	10	481	52	12	24	16	64	45	189	11	1	49	8	51	71	111	626	1, 821
Total.	486	12, 259	1, 098	38	2, 094	505	1, 878	1, 076	2, 642	331	11	1, 007	243	1, 109	1, 000	1, 531	10, 342	37, 350

38 REPORT OF COMMISSIONER OF INTERIOR FOR PORTO RICO.

Statement of mortality, by age and color, from July 1, 1901, to June 30, 1902.

Month.	Under 1.	From 1 to 2.	From 2 to 5.	From 5 to 10.	From 10 to 20.	From 20 to 30.	From 30 to 40.	From 40 to 50.	From 50 to 60.	From 60 to 70.
July.....	348	197	185	139	204	256	190	144	107	99
August.....	384	184	214	184	213	263	199	148	124	103
September.....	383	142	195	180	202	326	228	169	126	92
October.....	371	146	205	173	269	284	238	173	156	98
November.....	454	155	189	182	238	310	217	182	135	106
December.....	412	125	174	125	231	282	195	187	153	86
January.....	437	155	181	171	183	289	186	169	140	102
February.....	390	97	129	126	193	243	202	127	150	74
March.....	421	113	114	137	186	267	182	167	138	125
April.....	352	109	113	112	202	269	181	115	109	67
May.....	393	129	135	147	174	245	164	124	134	96
June.....	442	138	153	108	173	226	152	108	100	77
Total.....	4,689	1,690	1,987	1,784	2,468	3,260	2,334	1,813	1,572	1,125

Month.	From 70 to 80.	From 80 to 90.	From 90 to 100.	Over 100.	Un-known.	White.	Mulatto.	Black.	Total.
July.....	54	25	10	3	2	1,449	451	63	3,926
August.....	62	35	11	7	1	1,540	506	86	4,264
September.....	47	31	9	4	4	1,440	593	107	4,280
October.....	85	42	18	5	6	1,613	529	93	4,504
November.....	53	29	19	1	1	1,607	545	119	4,542
December.....	72	36	12	3	2	1,485	518	92	4,190
January.....	72	41	20	5	1	1,514	535	103	4,304
February.....	43	26	16	3	0	1,243	460	86	3,638
March.....	62	39	10	4	3	1,421	452	95	3,936
April.....	47	37	13	1	1	1,233	421	74	3,456
May.....	62	29	7	1	0	1,278	485	77	3,680
June.....	54	32	12	2	3	1,259	449	72	3,560
Total.....	713	402	157	39	24	17,112	5,944	1,067	48,280

List of disinterment and burial permits issued by the superior board of health, Porto Rico, from July 1, 1902, to June 30, 1902.

Removed from—	Removed to—	Number of permit.	Number of bodies.
New York.....	San Juan.....	50	1
San Juan.....	Manati.....	51	1
Do.....	New York.....	52	1
Do.....	San Juan.....	53	59
Rio Piedras.....	do.....	54	1
San Juan.....	Caguas.....	55	1
Mayaguez.....	Aguadilla.....	56	1
Do.....	New York.....	57	1
San German.....	San Juan.....	58	1
Naguabo.....	do.....	59	1
San Juan.....	New York.....	60	1
Do.....	San Juan.....	61	27
Yauco.....	Ponce.....	62	1
San Juan.....	Rio Piedras.....	63	1
Rio Piedras.....	San Juan.....	64	1
Bayamon.....	do.....	65	1

EXHIBIT C.

REPORT OF THE ASSISTANT COMMISSIONER OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR OF PORTO RICO,
BUREAU OF AGRICULTURE AND MINES,
San Juan, July 15, 1902.

SIR: In compliance with your instructions, I have the honor to submit herewith a report concerning the bureau of agriculture and mines for the fiscal year ending June 30, 1902:

The conditions of this bureau have been the same as stated in my previous report. On account of the same lack of means then pointed out it has not been possible to undertake any work in any of the lines suggested in my statement of January 10, 1901,

and the operations have therefore been confined to collecting some general data regarding the crops of the island, furnishing information on matters connected with agriculture and mining, and carrying out all the business relating to mining claims and concessions.

The information obtained shows a great increase in the principal crops for the last year, and suggests the following remarks:

Sugar.—The crop in the year 1901 amounted to 95,850 tons, i. e., 34,350 above the crop of 1900, which was not more than 65,500 tons.

The extent of lands planted with sugar cane about the month of June, 1900, was, according to the statistics collected by the bureau, 82,678 acres. It is estimated that in 1901 the area of cane fields increased about 10 per cent, so amounting to 91,000 acres. As three-quarters of this extent is to be ground during the present year, the amount of the crop for the same may be estimated at 105,000 tons of sugar, so reaching very near the crop of 1884, which amounted to 108,000 tons, and has been the largest crop of the island up to the present time.

With the establishment of some large new factories, the cane plantations are considerably increasing, and it is to be expected that within a very few years the island will produce more than twice as much sugar as it does at present.

Coffee.—The extent of coffee groves at the beginning of the year 1899 was about 180,000 acres, which yielded annually an average of 26,380 tons of marketable coffee. The hurricane of August 8, 1899, destroyed many of the coffee trees, and the crop for the same year was reduced to 6,700 tons. The area covered at present by this culture, including all the groves which have been put more or less in condition of bearing, amounts to 166,000 acres, which should yield normally, as an average, 24,230 tons. The work of cleaning the plantations and repairing the injuries caused by the cyclone made little progress at first on account of the lack of means of the landowners. For this reason the crop for the year 1900 was only 9,200 tons, but in the past year the conditions have been greatly improved and the crop, part of which is yet being exported, may be estimated as two-thirds of a normal one. According to the information received, the work performed during the present year is such as to have the groves restored to their former condition in a few months; even some new plantations have been set up, notwithstanding the low price at which this staple is sold now, and it may be anticipated that if the weather is favorable the next crop will not be far from the average amount above mentioned.

Tobacco.—The plantations of tobacco, which were somewhat diminished in 1899 to 1900, were considerably increased the following year, as free trade with the United States was expected to be soon established, thus offering a profitable market for the crop. The exact amount of this crop can not be given, but it may be estimated that it exceeded 4,000 tons. For the crop which is still being reaped the plantations were extended everywhere, even over districts in which tobacco had never been grown, as far as seed was available, and possible transportation of same. The extraordinary rainfall during the months of December and January caused a good deal of damage, and the crop was partially destroyed in some districts, but many fields were replanted, and notwithstanding the disfavorable weather this crop will be far above the largest the island has ever known.

Minor crops.—Plantains, bananas, sweet potatoes, corn, rice, beans, pease, and the other so-called minor fruits have been planted to the same extent as the preceding fiscal year, and have generally yielded good crops. The planting of orange and other fruit trees has been carried on with increasing activity, but not to the degree that this most promising branch of agriculture deserves. Pomology is practically unknown in Porto Rico, and some people fear that, after having expended money in planting and taking care four or five years of orange trees, they may not be successful in having the trees bear paying crops. The plantations already started, the most part by Americans, will render, within two or three years, due experience. Their success, it is to be hoped, will dissipate all apprehensions and contribute to promote a more rapid development of fruit growing all over the island. The importance of this new industry may be appreciated by the fact that the exports of uncultivated oranges and some other wild fruits has been worth more than \$100,000 in the first year that this business has been undertaken.

Mines.—At the beginning of the fiscal year 21 applications for mining concessions were pending; besides, 31 more were filed during the year. Of these 52 claims—the location, character, and status of which is given in the inclosed tabulated statement—30 were granted, 14 canceled, 1 was renounced, and 7 were still pending on June 30, 1902.

There are at present 80 concessions for iron, copper, gold, salt, and other minerals that remain in force, but, except one or two gold placers and some salt works, they are not in operation. The rent accruing to the insular treasury from these concessions amounts to \$3,589.70.

The work done in some gold placers in Corozal has not as yet shown that the deposits are positively rich enough to be worthy of being worked, but the prospectors are not discouraged. Most of the iron deposits now discovered are valuable. The ore is of first quality, and seems to be existing in large quantities. Some copper and lead ore have been recognized to be also of very good quality, but investigations have not been made to ascertain the amount of the deposits.

Future work.—The small sum appropriated in the budget for the current fiscal year will provide for visits to the agricultural districts from time to time, for the purpose of establishing proper relations with farmers and collecting data and statistics. An agricultural bulletin will be published and distributed free. It will contain all useful information for the tillers of the soil resulting from the investigations made on the ground by the bureau, or taken from other sources, especially from the publications issued by the United States Department of Agriculture. Full or condensed translations into Spanish of the most important items found in these publications, containing practical and useful information applicable to Porto Rico, will be inserted. The usefulness of circulating information on many subjects may be seen, as an instance, in the fact pointed above regarding the apprehensions on the results of planting orange trees.

Very respectfully,

JUAN BLA RODRIGUEZ,
*Assistant Commissioner of the Interior,
Chief Bureau of Agriculture and Mines.*

HON. WILLIAM H. ELLIOTT,
Commissioner of the Interior for Porto Rico.

APPENDIX A.—*Report of the chemist of the laboratory.*

SAN JUAN, P. R., June 16, 1902.

SIR: I have the honor to submit the following report on the work of this laboratory for the past fiscal year:

In general terms the character of the work has been very similar to that of the preceding year and a half, and like that has been practically limited to an investigation of such articles of food as the experience acquired during the past two years has shown are more apt to be adulterated or of inferior quality. It is gratifying to note a gradual development of interest in the work of the laboratory on the part of the public at large, as has been shown by an increase in the number of samples sent to the laboratory from various parts of the island. Of course everything has been done and will be done to stimulate and develop this interest, which we must secure and hold if we hope to bring our work to its maximum efficiency. I am very sorry not to be able to report any considerable progress in the direction of extending the work of the laboratory into the outlying towns of the island, the advisability of which is so evident as to call for no emphasis on my part, and it is hoped that an improvement in this respect may be effected in the very near future.

I would again respectfully call your attention to the inevitable results of confining the operations of the laboratory to the narrow district to which it has heretofore been restricted, the ultimate effect of which will be, not any very decided decrease in the amount of adulterated food sold in this island, but rather a concentration of it at those points which lie beyond the limits to which our investigations at present extend, resulting in an intensification rather than diminution of the evil which it is our special desire to correct.

The investigations of the past year have presented evidence which will go far toward the solution of the problem, as to who are really responsible for the condition of such articles as may be found to be adulterated or inferior, as frequent examinations have been made of samples secured immediately after their arrival from Europe or America, by which means, it is hoped, will be proved whether the adulteration (if such is detected) has been practiced prior or subsequent to the arrival of the article in Porto Rico, thus not only relieving from all suspicions of culpability those really innocent, but at the same time furnishing information of value in the suppression of the sale of such articles.

Of course this same method is, whenever practical, applied to the examination of articles of native production.

It is with great regret that I have to report the continuance of conditions which have made practically impossible the prosecution of investigations in the direction of a systematic examination of the water supply of the island, the importance of which can scarcely be overestimated. While repeated examinations of the water furnished from the aqueduct of San Juan has shown it to be of very fair quality so far as a

purely chemical examination reveals its character, and aside from an undesirable amount of impurities of a purely physical nature at times, due to imperfect filtration or other mechanical defects, the data obtained from the examination of well and cistern waters lead to altogether different conclusions.

When it is remembered that it is from these latter sources that a very large part of the water supply of the island is derived, the very urgent necessity of an investigation of the kind mentioned is too obvious to need further demonstration. I do not think that anything short of the impossibility of doing it will justify the continued delay of this work. In addition to the routine work of the laboratory, which, as has been stated, has consisted very largely of articles of food, there has been a marked increase in the number of applications from the courts of the island for examinations of various kinds in connection with criminal cases.

These have required examinations from time to time of clothing, viscera, articles of food supposed to have produced sickness or death, etc.

In this connection I would call your attention to the urgent necessity of issuing in printed form clear and explicit directions for the guidance of those sending articles to this laboratory for examination, as to the proper manner of securing such, the quantity required for analysis, and the precautions to be observed in the shipment of these.

I would also suggest, as a means of securing the information that is especially necessary in examinations arising from criminal cases, not only to avoid unnecessary delay, but also of prime importance in preventing erroneous conclusions, based on the results of the examinations, that a sufficient number of printed forms similar to attached sample be printed and distributed throughout the island to the various judges, alcaldes, health officers, and others liable to need them. The experience of the past has abundantly proved the urgent necessity of insisting on the observance of the greatest care in such cases, in which the extreme carelessness so often observed is fraught with such serious consequences.

The increase in the amount of work noted over that of the past year is due in part to a very welcome as well as valuable addition to the personnel of the laboratory through the appointment of Mr. Rafael del Valle as assistant chemist.

Mr. del Valle entered upon the discharge of his duties on September 19, and throughout the whole period of his connection with the laboratory has continued to render most valuable services by the careful and very satisfactory discharge of all duties assigned him. I hope very much that it will be possible at an early date to increase the salary attached to this position to a figure more commensurate with the amount and kind of services rendered. The duty of securing samples for examination at the laboratory, which has devolved upon Mr. José Maymó, has also been done in a very satisfactory manner. I would also be less than just if I failed to commend the unfailing industry of the janitor of the laboratory, James Furlong, who has rendered continued service in it from its organization in a thoroughly satisfactory manner.

In conclusion, I would respectfully make the following suggestions looking to the increased efficiency of this department of your work.

While the equipment of the laboratory, so far as the stock of chemicals and such apparatus as the ordinary demands made upon it require, is fairly satisfactory, very urgent need of more room has been intimated, and is a question which I hope will find a satisfactory solution at a very early date. Besides the additional room absolutely necessary for the work of water examination, the frequent demands upon your chemist for examinations in connection with criminal cases, upon the successful prosecution of which examinations life and death may depend, makes of no less importance the addition of another room in which such investigations can be conducted with freedom from the interruptions inevitable under the present conditions. When it is remembered that the fines imposed upon the violators of the food law, arising from prosecutions recommended by your board, which in turn are based on the results of examinations made in this laboratory, are sufficient to pay, if not all, at least the greater part of its current expenses, it is certainly not an unreasonable expectation that all possible means will be afforded those connected with it to discharge in a satisfactory manner the multitudinous duties devolving upon them.

To the above urgent reason for selecting a more suitable location for the laboratory, may we add the fact that the condition of the rooms at present occupied is such as to be not only a constant and serious menace to the health of those occupying them, but owing to their location in the immediate proximity to the sea, serious injury to the instruments stored in them is unavoidable. I hope that the urgency of immediate action in this matter may be thoroughly impressed on those capable of making such action effective. The importance of securing the interest and the cooperation of the public in our work has already been referred to, and I shall take the liberty of recommending such means as seem to me apt to be of value in obtaining

this object. Of those which appear to me to be of prime importance, I would suggest a more liberal use of the press. The publication throughout each year of bulletins describing the nature of the investigations conducted in the laboratory for the preceding three months, say, together with a statistical statement of the results of these, would not only satisfy a desire on the part of the public to know something of the work accomplished, but would also, I am persuaded, serve to show its real value and suggest means by which the public could aid materially in its advancement.

If besides such statistical statements the bulletins contained brief directions for the proper care of such articles of food as might be treated of in them and also describe simple means for the detection of the more common adulterants of these, I am sure that the educational value of such literature would be very considerable, and besides you would thus put in the hands of the public a means of defending themselves against the consumption of impure food, which is the prime object with which our investigations are made. Unfortunately, those most unfamiliar with the workings of this laboratory are introduced to it by officers of the law, and if upon such the impression is produced that it is used as a means of prosecution rather than a means of defending him or them against unsanitary conditions, their conclusions are perhaps not altogether unnatural, though certainly unfortunate, and all possible means should be taken to correct them. It is unquestionably true that a great deal of the unsatisfactory condition of the various articles of food sold in this market is due to ignorance as to any effective means of preventing or remedying them. And it seems to me that systematic instruction by such publications as I have described would abundantly justify by its results all expense and labor incurred. In connection with this subject of the extension of the field at present covered by our investigations, I would suggest that the articles of food entering this port from distant points be extended so as to include the examination of those whose character might be revealed by other than chemical means—such, for example, as fruits and vegetables in their natural state, meat, etc. Very frequently the adoption of such means would prevent the presentation of such articles for sale and would avoid the necessity of a more tedious chemical examination.

Within the last few months a standard of purity for the various articles of food, drink, etc., has been adopted after a careful inspection of those recognized, both in Europe and America, and a proper consideration of such local conditions in Porto Rico as suggest the necessity of modifying the requirements in other countries. In this connection, I would respectfully repeat the recommendation made some time since that before the final adoption of these standards you invite the inspection of them by the merchants of the island and others interested in order that when finally published they may contain only such provisions as may appear necessary to obtain their sole object—that is, the prevention of the sale of articles either positively injurious to health or that purport to be of a nature or class different from what they really are.

In spite of the fact that legal proceedings against violators of the food law, based on recommendations sent out from your board, are almost of daily occurrence no report is made to you of the results of such prosecutions, and consequently it is impossible to know the number of such carried to a successful issue.

I think that not only should such information be furnished to your board as data to be permanently recorded, but also that a statement of such legal proceedings as are recommended by it, together with the result of these, should be published at regular intervals, as a matter of public interest and for the sake of the moral effect they might have.

I would respectfully call your attention to the appended table prepared by the assistant chemist, Mr. Rafael del Valle, in which is presented in a statistical form the results obtained in the numerous investigations conducted throughout the past year, so far as these results can be so expressed.

The various articles examined, arranged in general terms, in the order corresponding to the number of samples of the different classes investigated, are as follows:

Milk.—Of the total number of samples of all kinds examined, 403, or 75.33 per cent, were samples of milk taken not only from the various milk depots of San Juan, Puerta de Tierra, Santurce, and Rio Piedras, but also those secured directly from a number of the "vaquerias," or milk farms, of this vicinity, as well as at the different "ports of entry" through which milk reaches this market.

The importance of securing for this community a supply of milk of reasonably good quality is so evident that it is thought a relatively very large amount of time and trouble devoted to the investigation of this article, fully warranted by this consideration.

When it is remembered that milk is the food par excellence of very young children and invalids, both especially susceptible to injury from imperfect nutrition, no further statement should be necessary to demonstrate the extreme importance of a constant sanitary supervision over it. If a mere deterioration in the quality of the

milk were the only result arising from its adulteration, the offense might be regarded as of a somewhat less serious nature, but when the adulterant is (as is true in almost all cases) water, which in all likelihood contains in itself the germs of disease, the practice certainly wants the use of the strongest terms in condemning it and the employment of the most stringent measures in its suppression.

It is to be regretted that in spite of all the precautions taken looking to the suppression of this most iniquitous practice, the percentage of adulterations has increased rather than diminished.

For this truly deplorable state of affairs there seems to me to be only one satisfactory explanation, viz, that those who have the power to correct the evil by the imposition of suitable fines upon all convicted of selling adulterated or impure milk, do not fully appreciate the extreme importance of putting a speedy stop to this altogether unwarranted and unjustified form of adulteration.

In this connection I would also call your attention to the advisability, to say the least, of a careful examination by a competent person of the cows of the various dairy farms supplying milk to this market.

Such an examination should, of course, include an investigation both of the "vaquerias" and milk depots as to what precautions, if any, are taken to avoid the contamination of the milk through the introduction of material that a purely chemical examination fails to detect.

To adopt every possible means to guard against the contamination of this article of such universal consumption is only to place ourselves in the ranks of those who are most scientifically and most effectively combating conditions prejudicial to public health.

Some explanation in connection with the data referring to milk seems necessary to avoid erroneous conclusions.

In the first place the percentage representing the adulterations for each month should always be taken in connection with the total number of samples examined in that month, in order that a proper value be assigned to the figures representing the adulteration. For example, in the month of July two of the seven samples examined were adulterated, but it would not be fair to assume that if 50 samples had been examined the same percentage of adulteration would have been found.

Again, the very notable decrease in the number of adulterated samples in September and October is due to the fact that almost all of the samples examined in these two months came directly from the country and were not exposed to the malign influences of the city, apparently so disastrous to milk of the highest character.

There is every reason for thinking that if these samples had been secured as usual in the open market the percentage of adulteration would have been very much greater for that month, which in turn would of course have very materially increased the total adulterations for the year.

Wines.—The investigations of wines throughout the past year, like those embodied in my previous report (which dealt almost exclusively with those of native production and therefore, of course, purely artificial), have been conducted with a view of learning the character of those imported into the island.

Of the 36 samples examined, 11, that is, 30.56 per cent, were adulterated and 14, or 38.88 per cent, were inferior. Of the adulterated, 7 contained an excess of "sulphates," expressed as potassium sulphates, and 4 contained aniline coloring material.

Lard.—The results of the examination of the 29 samples belonging to this class show pure lard to be a comparatively rare article in this market, 23 of the 29 samples examined being compound lard. Of course no serious objection can be raised against the sale of such provided its true nature be made known to any would-be purchaser.

Water.—In the classification of the 21 samples of water the description of 12 of these as good indicates merely that the data obtained in their examination was not considered sufficient to condemn them, although they were not of an altogether satisfactory character.

Butter.—The results obtained in the examination of the 17 samples of butter show that the greater part of this is of a very inferior quality, in spite of the very flattering credentials by which they are accompanied. Although the table shows 9 samples classed as adulterated, one of which was oleomargarine, those described as inferior would have been in the class of adulterated had it been thought wise to apply even a moderately rigorous standard in classifying them.

Vinegar.—As in the case of butter, extreme leniency has been exercised in the classification of vinegar, freedom from any substance of an injurious nature and a total acid percentage of not less than 3 per cent (in terms of acetic acid) being the only requirement demanded to entitle them to be classified as genuine, except of course the additional one of conforming in their quality to that of a class to which they are purported to belong. Of the 4 samples classed as adulterated, one contained free sulphuric acid 59 per cent, and the remaining three were deficient in acetic acid.

to the hundreds of unlicensed and unmuzzled dogs now at large in the streets of San Juan contrary to law. Should there be an outbreak of true rabies in this community it is hard to say to what extent the disease would prevail before being stamped out.

To recapitulate, I would respectfully ask your consideration of the following:

The cooperation of the insular police in enforcing all laws and regulations from this board. The establishing of a proper animal quarantine station, where tests and experiments for all contagious diseases of animals can be made and where such persons who so desire can be instructed in the rudiments of meat, animal, and food inspection, under the direction of the inspectors in your department. This will form a nucleus from which the various municipalities can eventually be supplied and that in time may give thorough, reliable sanitary inspection, even to the smallest town in the island.

Very respectfully submitted.

E. SCHIRMER,
Veterinary Inspector.

THE PRESIDENT OF THE SUPERIOR BOARD OF HEALTH.

APPENDIX C.—*Report of the inspector of plumbing.*

SAN JUAN, P. R., June 16, 1902.

SIR: When I was appointed to my position in November of last year, I found that the plumbing work being carried on in this city was being done by anyone who cared to do so. There being no one to oversee the work or to enforce the regulations, they put in work just as they pleased and used any class of material they chose. I found, among others, blacksmiths, machinists, masons, and carpenters all doing so-called plumbing.

To put a stop to this the board held examinations in November last, for the purpose of weeding out all of those who are unable to do at least a fair job, and to give those who had some knowledge of the trade a fair chance to improve themselves in their work, and to compel house owners to put in good sanitary plumbing.

The examinations, which were not very bad, gave very satisfactory results. Seven plumbers were successful for master plumber licenses, and 20 passed as journeymen.

Those who passed the examinations have been given every chance possible to improve in their work and seem very anxious to learn, and at present the plumbing department of the board is running along very smoothly.

There was quite some trouble at first with some of the owners of houses, who did not seem to wish to break away from the old order of things, which allowed them to hire a laborer or anyone they could get cheapest, and to put in any class of pipes or fixtures they chose to use, but they are gradually realizing that it is to their benefit to have good work done in place of the old order of things.

In many of the houses denounced the fixtures had been installed but a few months previous, and at considerable expense to the owner; and in most of them it would have been far better if improvements in this line had not been attempted, from the manner in which it had been carried on.

Since November 14 of the last year plans for plumbing work of 185 houses have been filed, most of this work having been ordered done by this board.

Among other buildings I have inspected have been those of the high school of Mayaguez, boys' charity school at Santurce, normal school at Rio Piedras, and the ayuntamiento of this city, and when the plumbing being done in this city is finished they will be in splendid sanitary condition.

There are still several buildings being used as schools which are in anything but sanitary condition, but in time this will be remedied also.

It was found necessary to prosecute several house owners who did not obey the orders of the board regarding their buildings, and also some persons who did plumbing work without being licensed to do so by the board.

After the present month a heavier grade of soil pipe is to be introduced and the water and smoke test will be applied to all work done in the future. With the new regulations enforced, better sanitary work will be assured in all cities of the island, where plumbing will be done under the supervision of the inspector of the superior board of health.

There are still a large number of houses in this city in which there had been absolutely no plumbing installed, most of these buildings being situated on streets which at present do not contain sewers. As soon as these streets are sewered, the owners of the houses will be compelled to do away with the present filthy cesspools and to install sanitary sinks and closets.

GEORGE SPAVEN,
Inspector of Plumbing.

THE PRESIDENT OF THE SUPERIOR BOARD OF HEALTH.

EXHIBIT D.

REPORT OF THE SUPERINTENDENT OF INSULAR TELEGRAPH,
DEPARTMENT OF THE INTERIOR OF PORTO RICO, BUREAU OF
INSULAR TELEGRAPH.SAN JUAN, P. R., *July 25, 1902.*

SIR: In compliance with your letter of June 3, 1902, I have the honor to submit herewith a report covering the operations of the bureau of insular telegraph for the fiscal year ending June 30, 1902:

TELEGRAPH LINES.

In addition to the number of kilometers of telegraph lines operated by the bureau of insular telegraph, as shown in my report for the period February 1, 1901, to June 30, 1901, new wire aggregating 140 kilometers in length has been strung, making a total length of line controlled by this department on June 30, 1902, of 1,170 kilometers, and in addition to the 18 offices in operation for the same period (February 1, 1901, to June 30, 1901) 11 additional offices have been opened, making a total of 29 offices in operation by this service on June 30, 1902.

A tracing showing the telegraph lines in operation, etc., is attached to this report. (Exhibit A.)

An appropriation of \$26,187.65 was made by the legislature of Porto Rico at its last session for the extension and maintenance of the telegraph system. This amount was sufficient to enable this bureau to have extended the telegraph lines to all important points on the island, but owing to the late date on which the money was available (March 1, 1902), limiting the period in which the work had to be done, as well as to almost incessant and heavy rains, rendering it difficult to proceed with the construction of the new lines, the results accomplished in the way of increasing the mileage of the system fell short of expectations.

As soon as the appropriation became available, sufficient material was ordered from the United States to extend the system 420 kilometers, and additional instruments were ordered to increase the number of offices to 40 and to allow a reasonable reserve supply.

Considerable delay was caused by the late shipment of the instruments and wire, the latter having to be ordered specially from the mills to conform with specifications given. All instruments and material were ordered from the Bunnell Telegraphic and Electrical Company, of New York, the bid of that firm being considered the most advantageous to the government of all the quotations received. The instruments and material received under this bid were found to be of good quality and have proved highly satisfactory.

Upon arrival of the material construction was begun on the Arecibo-Ponce line, May 1, 1902, the work progressing slowly, owing to difficulty encountered in the transportation of poles, caused by the continuous swollen condition of the streams, making them impassable much of the time. The line was completed and in operation as far as Utuado, a distance of 31 kilometers, on May 23, 1902.

The work of rebuilding the telegraph line between Caguas and San Juan via Humacao was begun at the last-named place on May 21, 1902, and completed to Rio Piedras on June 11, 1902, a distance of 78 kilometers, over all of which distance new No. 9 galvanized-iron wire was strung.

The work on the Ponce-Arecibo line, which had been abandoned at Utuado, the unfinished state of the road not permitting ox carts or other necessary transportation to pass between Utuado and Adjuntas, was resumed at Ponce on June 8, 1902, and the line was completed as far as Adjuntas on June 30, 1902. The work of constructing this line was also carried on under the utmost difficulty. The route of this line as surveyed follows the course of the new road now being constructed, a portion of which new road for a distance of about 7 kilometers is not yet completed. Over this all poles used along said road had to be carried by peons, thus making progress slow and materially increasing the cost of construction of this section of the line.

New lines through the city of Ponce and from Ponce to Playa-Ponce, a distance of about 4 kilometers, have been built. The construction of this line commenced May 10, 1902, and was completed June 27, same year, the work having been delayed on account of heavy rains. All insular government wires entering Ponce are now carried on cross arms on one line of poles through the city. Owing to the care taken in selecting the poles for this line, all of which are red cedar, treated with a well-known wood-preserving solution, and the selection of a clear route throughout the city, as

well as the excellent manner in which the work was done, makes this perhaps the best section of telegraph line in Porto Rico.

Contracts have been let for the following lines, upon which work will be begun as soon as the weather permits: Adjuntas-Utuado, a distance of 22 kilometers; Aguadilla-Lares, a distance of 39 kilometers; Rio Piedras-San Juan, a distance of 14 kilometers.

Owing to difficulty in securing poles of the proper dimensions at a reasonable price, the work of building the telegraph line between Humacao and Arroyo was postponed until more favorable conditions prevail. This section, however, is important for the reason that it will complete the section San Juan-Ponce via Humacao, and it passes through towns of considerable commercial importance. The completion of this section will be an important addition to the telegraph service of Porto Rico.

General repairs to all insular telegraph lines were commenced on May 1, 1902, and completed on or about the last of same month, all lines having been placed in general good repair.

The poles of the San Juan-Ponce section which follow the course of the military road were found to be rapidly deteriorating, owing to climatic conditions and from attacks of wood-eating ants. These poles are of cypress wood and, being soft, seem to attract the ants. These insects attack the wood from the interior and do not leave a pole until they have almost completely devoured it. The destruction being carried on in the heart of the pole, and continued until there is but a shell left, is not discovered until the pole has fallen from the weight it carries.

The rapid growth of vegetation is a source of annoyance to the telegraph lines in Porto Rico, greatly impairing the insulation when in contact with the line, as well as the falling upon the wire of heavy cocoa palm limbs, the weight of which, in many cases, is sufficient to break or tangle the wires.

HELIOGRAPHIC COMMUNICATION.

The matter of establishing communication between Porto Rico and the outlying island of Vieques has been given considerable study. It was first thought that a system of wireless telegraphy would be the most practicable, expeditious, and economical. But upon inquiring into the merits of the various systems of this branch of telegraph communication, it was found that none of the makers of the necessary apparatus could guarantee that their instruments would work satisfactorily over the distance required. Wireless telegraphy being therefore apparently yet in its experimental stage, the idea of establishing this mode of communication was abandoned, as the amount of money appropriated for providing communication with Vieques was not sufficient to permit this bureau to purchase, for experimental purposes, the necessarily expensive instruments that would be required, and at the same time to provide by other means a practicable and reliable system of communication.

The practicability of laying a cable between the points above mentioned was next considered. This would have been a highly desirable means of communication, but, unfortunately, the difficulty of securing a steamer to make the necessary survey, soundings, and lay the cable, all of which would have been expensive, would have greatly exceeded the amount available for such work. The expense of raising the cable in case of leaks or breaks had also to be considered. To make these repairs would require a vessel with grappling appliances and skilled men, all of which would prove expensive, which a cable of this length and importance would not justify. This scheme, therefore, was also found untenable.

A system of visual signaling was at last decided upon, and established in June, terminal stations being located at Isabel II, Vieques, and at Fajardo Light, P. R., connecting, at the latter-named place, with the insular telegraph land lines.

The system adopted, while considered by some to be slow and cumbersome, was found to be the only practicable solution.

The instruments used for transmission of messages by night are known as acetylene flash lanterns, and were obtained from a well-known firm in New York making a specialty of such instruments.

As will be seen by the title, the chemical employed in these instruments to generate the necessary gas for flashing is calcium carbide. By using the Morse telegraph alphabet, operators who heretofore had never worked this particular kind of instrument, but who are telegraphers, handled without difficulty from 20 to 25 words per minute. The Myer code, used almost exclusively by the United States Army and Navy, is specially adapted for use with these instruments, and while not as rapid as the Morse it is for this kind of work, perhaps, more reliable. The Myer was the code used by the United States Signal Corps in the Spanish-American war. The operators assigned to this work are experts in this class of signaling, using either code with equal facility.

The instrument used for transmission of messages by day is the heliograph of the pattern used by the United States Signal Corps.

It is with this instrument that the most difficulty will be experienced here, as sun rays are absolutely essential, these being the medium by which the heliograph is operated. Cloudy and rainy weather, which, to a great extent, prevails in the vicinity of Vieques, will, during such conditions, make the effective working of this instrument impracticable, in which case messages will have to be transmitted at night.

Since the United States Signal Corps abandoned a similar system of communication between these points on February 1, 1901, the residents of Vieques have had to rely upon the triweekly mails, this being their only means of communication.

The reestablishment of rapid communication it is thought will therefore be alike appreciated by the residents of Porto Rico and Vieques, and should do much to facilitate business between the two islands.

SCHOOL OF TELEGRAPHY.

To meet the prospective demand for operators as this bureau extends its mileage of lines, and with the view of placing at the disposal of the girls of Porto Rico an opportunity by which they may receive thorough instruction in telegraphy, as well as in the belief that they are quick to learn, and that, after a systematic and thoroughly practical course of instruction, they will make good and efficient telegraphers, it was decided to establish a school wherein they could be taught the art of telegraphy.

That the proposed establishment of such a school met with favor is attested by the numerous applications which have been received for admission to the school from young ladies from all parts of the island.

The school was opened on June 30, 1902, with an attendance of 25, that being the greatest number of students the rooms available for the purpose would accommodate.

A photograph of the students, taken during school hours, is appended herewith, marked "Exhibit B."

TELEGRAPH STATIONS.

All stations of this service have been equipped with the latest type of modern and improved telegraph instruments, and to the more important stations typewriting machines have been furnished.

Photographs showing the arrangement of the interior of the San Juan and Ponce insular telegraph offices, with the operating force at work, are appended herewith, marked, respectively, exhibit c and d, and also a photograph showing a section of main-line batteries at San Juan, exhibit e.

BOOK OF RULES.

In the absence of proper rules and regulations when the insular government assumed control of the telegraph lines, the military rules and regulations, with such revisions and amendments made from time to time as became necessary, were ordered to continue in effect until the rules and regulations now in force were promulgated.

The rules and regulations adopted were compiled at this office and have been printed in both English and Spanish, and are considered to be well adapted for the service. So far as local conditions permit, they follow closely the text of the rules published for information of their employees by the Western Union and Postal Telegraph companies, combined with those governing the operation of United States military telegraph lines. The book contains 100 pages.

HANDBOOK FOR STUDENTS.

For the guidance and use of the students of the insular government telegraph school, a book of instructions was published and printed in the Spanish language. This book treats on the practice of telegraphy in detail and contains all of the characters known to and used by Morse telegraphers. The book contains 30 pages.

STATEMENT OF BUSINESS.

Commercial messages handled over the insular telegraph lines for the fiscal year ended June 30, 1902, number 192,028, the cash receipts from tolls on which aggregated \$23,054.07, an increase of \$2,075.37 as shown for the same period in 1901.

The number of free messages handled over these lines for the same period was 14,033, the tolls on which if computed at Government rate would amount to \$3,797.68.

The increase of commercial business, as hereafter shown in Table I, has been steady. As a number of important offices were not opened until late in June, little

in the way of increase is shown by such new offices. The effect, however, of these additional stations in increasing receipts will soon be apparent, and it is deemed safe to say that with the number of offices now in operation, and with careful administration, the receipts from business handled will be sufficient to maintain the system, with a probable surplus within a few years, to cover the amount expended for the increased mileage of the new lines now under construction.

CONSTRUCTION OF NEW LINES.

As previously stated, owing to late date upon which the money appropriated for the construction of new lines became available, as well as in receiving the material from the United States, and the delay incident to heavy rains which have since prevailed, making transportation of material difficult to points where needed, the work of construction was greatly retarded, and much of the proposed new lines remain unfinished. However, the material necessary to complete the greater portion of these lines has been purchased, and contracts have been let for the building of the incomplete sections, which work will be begun after the rainy season is over.

The average cost per kilometer for constructing single wire lines, including labor and transportation of material, is \$38, and the contracts which have been made for the construction of similar lines will average about the same.

EMPLOYEES.

The employees of this bureau number 55, an increase of 14 over the number reported at the close of the fiscal year ended June 30, 1902, 84 per cent of which are Porto Ricans.

The number of American operators now employed by this service is 9, which number, owing to the extension of the system and the increase of business, should be increased to at least 15, as there is not a sufficient number of Porto Rican operators yet qualified to handle the business of the larger offices.

No comment is herein made upon the abilities of employees of this bureau, their efficiency being left to the judgment of the public. But it should in justice be said that each employee in his capacity has conscientiously performed his duty to the best of his ability.

The efficiency of the work is shown by the records in this office. During the entire period covered by this report there has not been a single complaint made by the patrons of the line for delay, inaccuracy, or for any other reason.

ADDITIONAL TELEGRAPH OFFICES.

There are a number of towns of limited commercial importance along the line of the Porto Rico Railroad at which the amount of telegraph business handled is small, as shown by experience of the Signal Corps when operating the telegraph system of the island, and for this reason it would hardly justify the insular government to maintain offices at such points.

The new franchise granted the Porto Rico Railroad Company prevents its handling commercial telegrams over its lines, but in order to provide such towns as above mentioned with telegraphic communication, the railroad company's franchise has been so amended by the executive council as to permit the company to handle commercial telegrams over its lines between points at which the insular government does not maintain telegraph offices.

TARIFF, RATES, ETC.

The commercial rate charged for telegrams by the bureau of insular telegraph is 20 cents for ten words, exclusive of address and signature; 5 cents cheaper than that charged by the commercial telegraph companies in the United States for a message with a corresponding number of words. The charge for additional words over and above ten is 2 cents a word. The rate charged for government messages and press matter is 1 cent a word, a minimum charge of 10 cents being made for messages of the latter class.

All departments of the insular government are accorded the free use of the telegraph. The volume of business handled for the various departments is considerable, and is computed at government rates, a statement of which business is shown elsewhere in this report (Table II).

Notwithstanding the low rate charged for commercial telegrams, which would naturally lead to the conclusion that the lines are operated at a considerable loss, the volume of this business has so increased under this moderate rate and American

methods of administration as to transform the telegraph system of Porto Rico, heretofore considered by some as an expensive and unprofitable institution, supported by the treasury, to a self-sustaining branch of the government. If all messages handled by this service for the various departments were charged for, even at the low government rate of 1 cent per word, the annual balance sheet of the disbursing officer of this bureau would show such a profit over and above the cost of operation and maintenance as to convince the advocates of government ownership of such enterprises of the wisdom thereof.

Respectfully submitted.

L. McGUIGAN,

Superintendent of Insular Telegraph.

HON. WILLIAM H. ELLIOTT,

Commissioner of the Interior for Porto Rico.

TABLE I.—Statement showing total number of messages handled, cash receipts from telegrams, value of free messages sent, total value of messages sent, total expenditures, and earnings or deficit for each month of the fiscal year ended June 30, 1902; also the totals under various headings.

Month.	Total messages handled.	Cash receipts from telegrams.	Value of free messages.	Total.	Total expenditures.	Earnings.	Deficit.
July.....	13,230	\$1,567.04	\$334.16	\$1,901.20	\$1,859.26	\$42.74	.....
August.....	13,181	1,641.54	409.09	2,050.63	1,784.90	265.73	.....
September.....	13,145	1,644.38	292.49	1,936.87	1,777.52	159.35	.....
October.....	17,140	1,836.83	268.89	2,105.72	1,867.64	288.08	.....
November.....	15,915	1,750.60	302.86	2,053.46	1,884.12	169.34	.....
December.....	17,279	1,896.62	243.48	2,140.10	1,906.13	233.97	.....
January.....	16,875	1,929.56	315.12	2,244.68	2,034.29	210.39	.....
February.....	17,486	1,934.98	231.90	2,166.88	1,874.88	292.00	.....
March.....	19,732	2,176.14	303.29	2,479.43	2,287.78	191.65	.....
April.....	19,018	2,152.24	296.69	2,448.93	3,003.37	.....	\$554.44
May.....	21,900	2,315.45	346.70	2,662.15	8,198.91	.....	5,536.76
June.....	21,160	2,208.69	453.01	2,661.70	4,741.33	.....	2,079.63
Total.....	206,061	23,054.07	3,797.68	26,851.75	33,220.13	1,843.25	8,170.83

TABLE II.—Statement showing what would have been the earnings of the insular telegraph on official messages transmitted during the fiscal year ended June 30, 1902, for each of the officers or class of officers mentioned below.

Class of officers.	Number of messages.	Number of words.	Amount.
The governor of Porto Rico.....	193	6,875	\$70.44
The secretary of state of Porto Rico.....	33	1,547	15.51
The attorney-general of Porto Rico.....	370	15,968	160.60
The auditor of Porto Rico.....	52	1,717	19.41
The treasurer of Porto Rico.....	2,351	70,884	729.73
The commissioner of interior, Porto Rico.....	94	3,078	31.26
The commissioner of education of Porto Rico.....	2,666	59,874	643.35
Officials of the board of public works.....	402	11,425	117.77
Officials of the superior board of health.....	198	5,474	56.29
Officials of the board of charities.....	19	553	5.55
Judges of the supreme court.....	12	407	4.17
The marshal of the supreme court.....	77	2,057	21.45
Judges of the district court.....	382	12,056	123.16
Fiscals of the district court.....	63	1,639	16.73
Officers of the insular police.....	2,606	55,833	608.44
Officers of the Army and Navy.....	3,920	92,142	1,002.63
Director of prisons.....	48	1,399	14.64
Post-office department.....	119	3,329	35.35
United States district court.....	10	285	2.98
Messages sent by holders of franks.....	1,260	30,742	1,063.98
Total.....	14,875	377,284	4,743.44

Total receipts, including value of free business..... \$26,851.75
 Total expenditures..... \$33,220.13
 Deduct cost of material purchased, building new lines, etc..... 8,577.47

Total cost of operation and maintenance..... 24,642.66

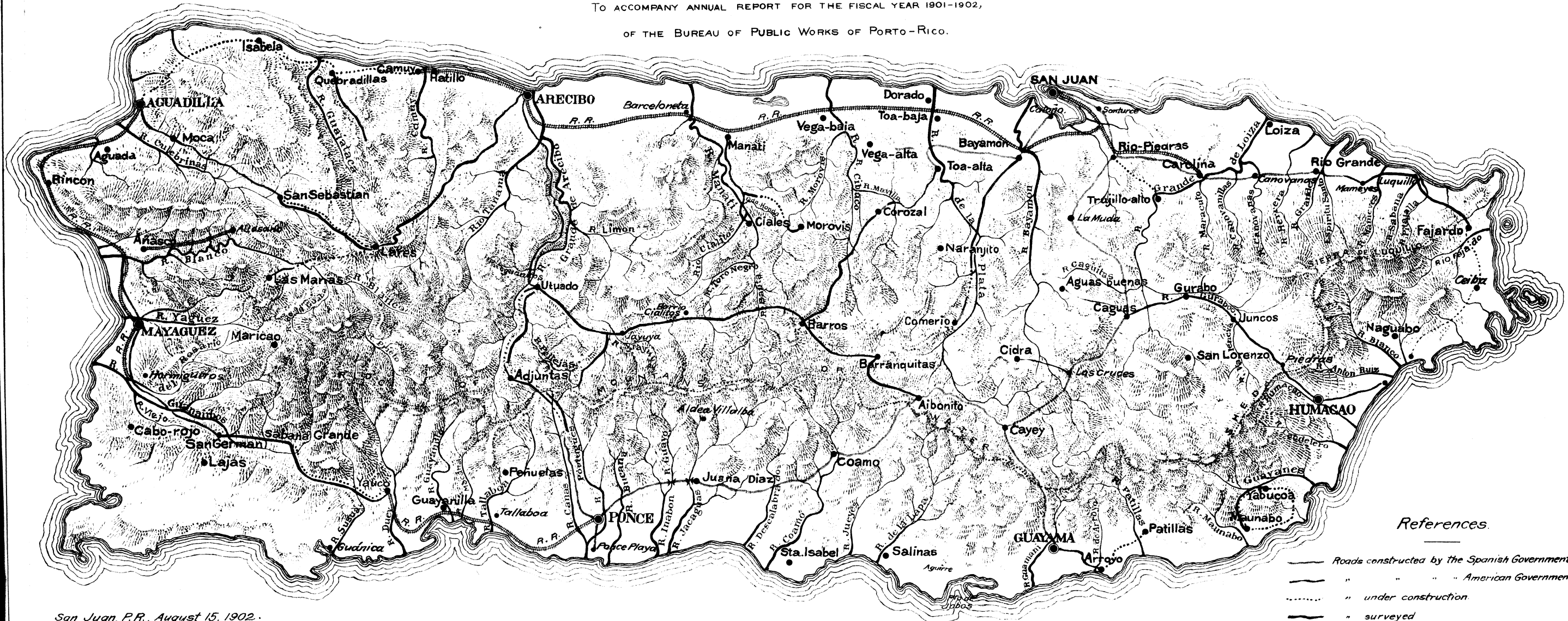
Total earnings of line, fiscal year 1901-1902..... 2,209.09



MAP OF PORTO-RICO

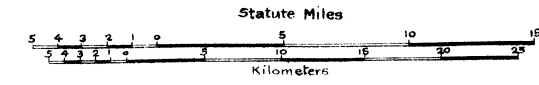
SHOWING DIFFERENT ROADS CONSTRUCTED AND UNDER CONSTRUCTION,
AND LINES SURVEYED FOR PROPOSED ROADS.

TO ACCOMPANY ANNUAL REPORT FOR THE FISCAL YEAR 1901-1902,
OF THE BUREAU OF PUBLIC WORKS OF PORTO-RICO.



References.

- Roads constructed by the Spanish Government.
- - - " " " " American Government.
- " under construction.
- - - - - " surveyed.
- Preliminary surveys.



San Juan, P.R., August 15, 1902.

J. F. C.

Superintendent of Public Works.

J. F. C.

Exhibit A

MAP SHOWING INSULAR TELEGRAPH LINES
OF
PORTO RICO

